THE Journal OF THE Kansas Medical Society

FEBRUARY
1955

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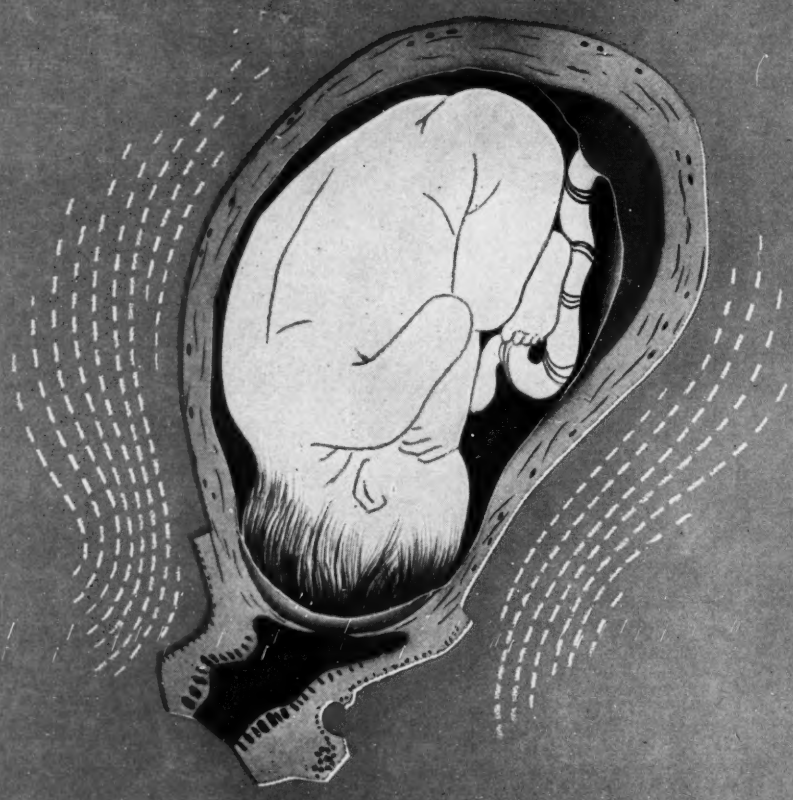

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*Kaufman, R. H.; Mendelowitz, S. M., & Ratzan, W. J.: *Am. J. Obst. & Gynec.* 65:269, 1953.

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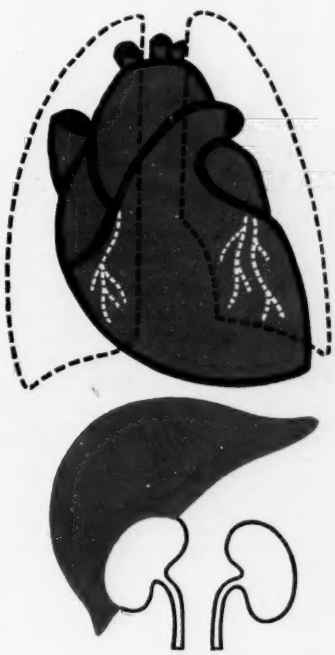

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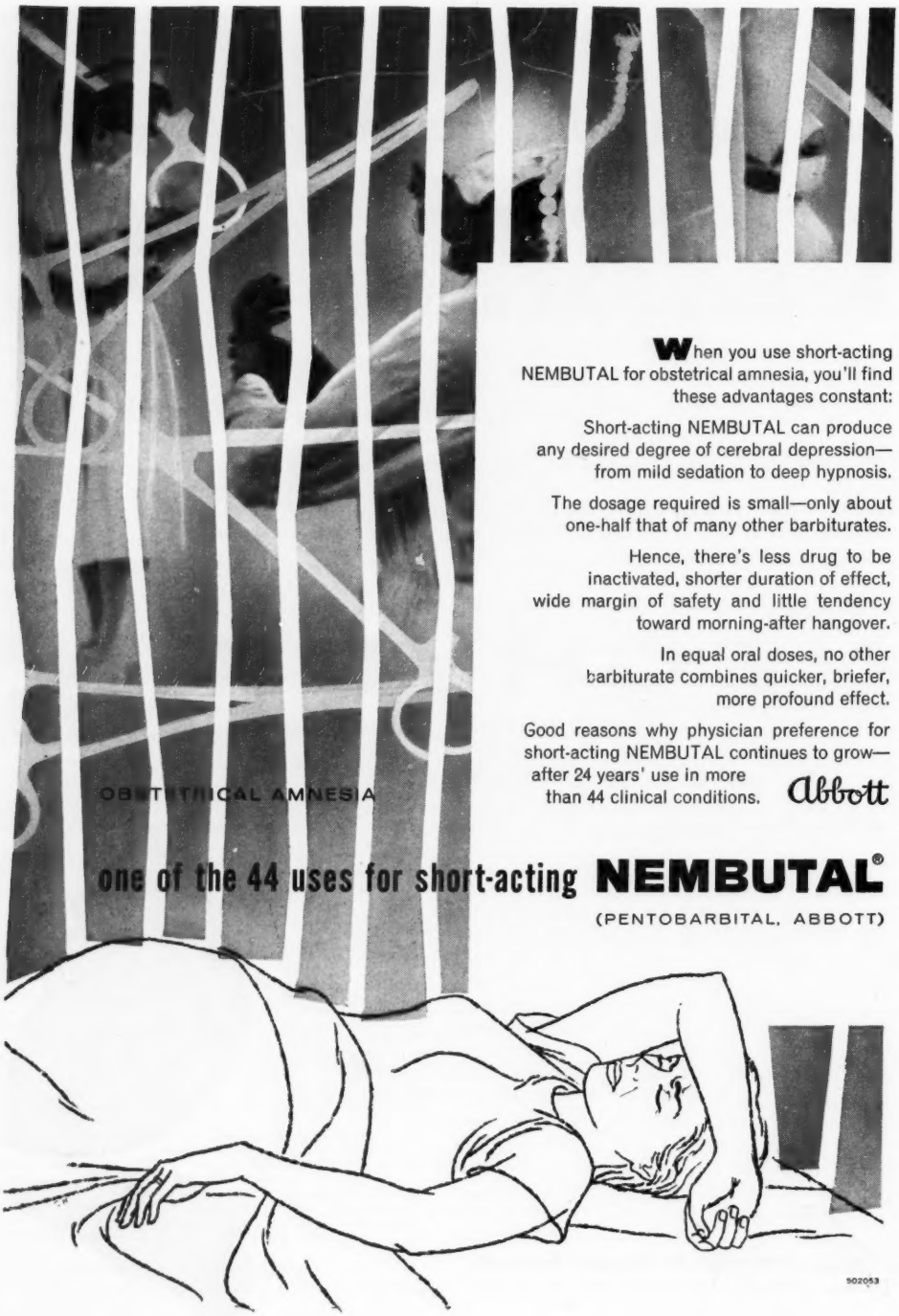

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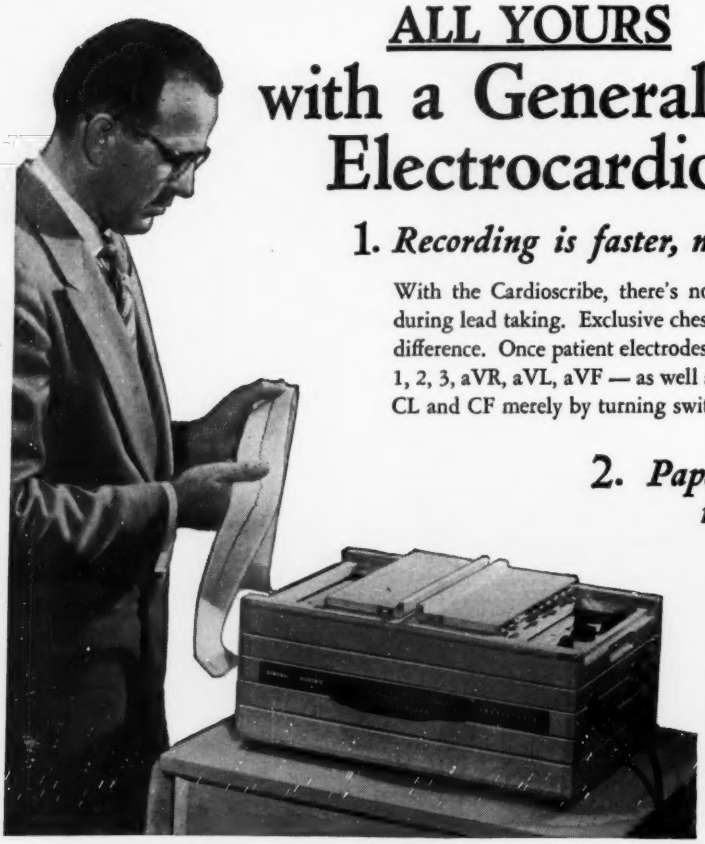

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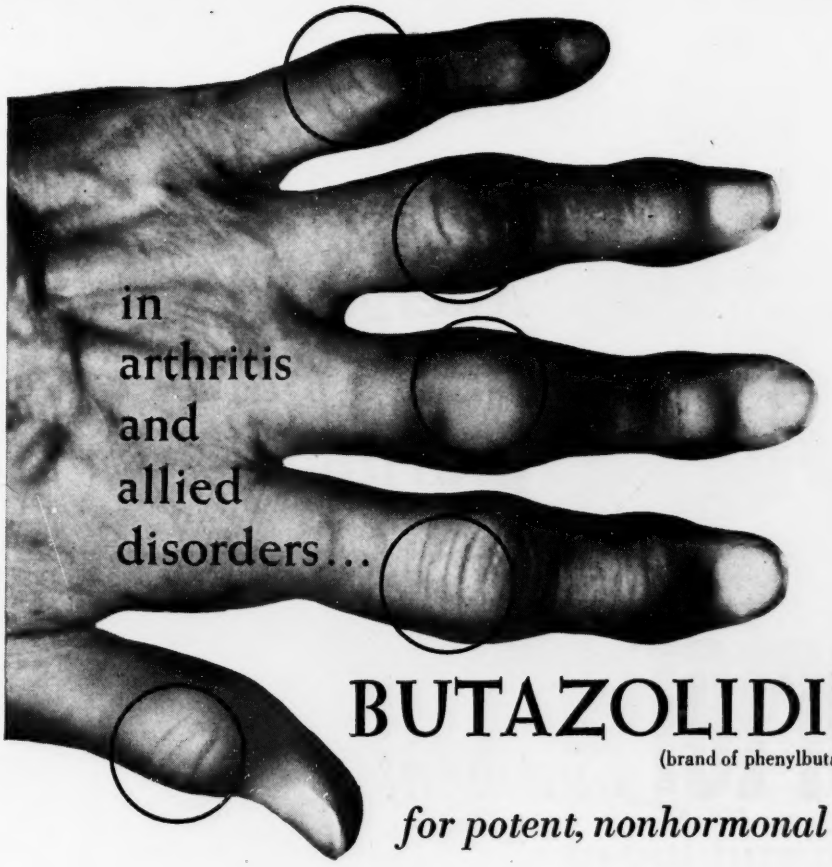

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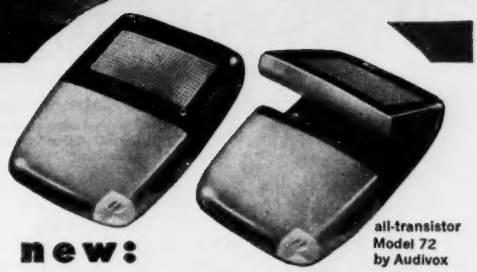

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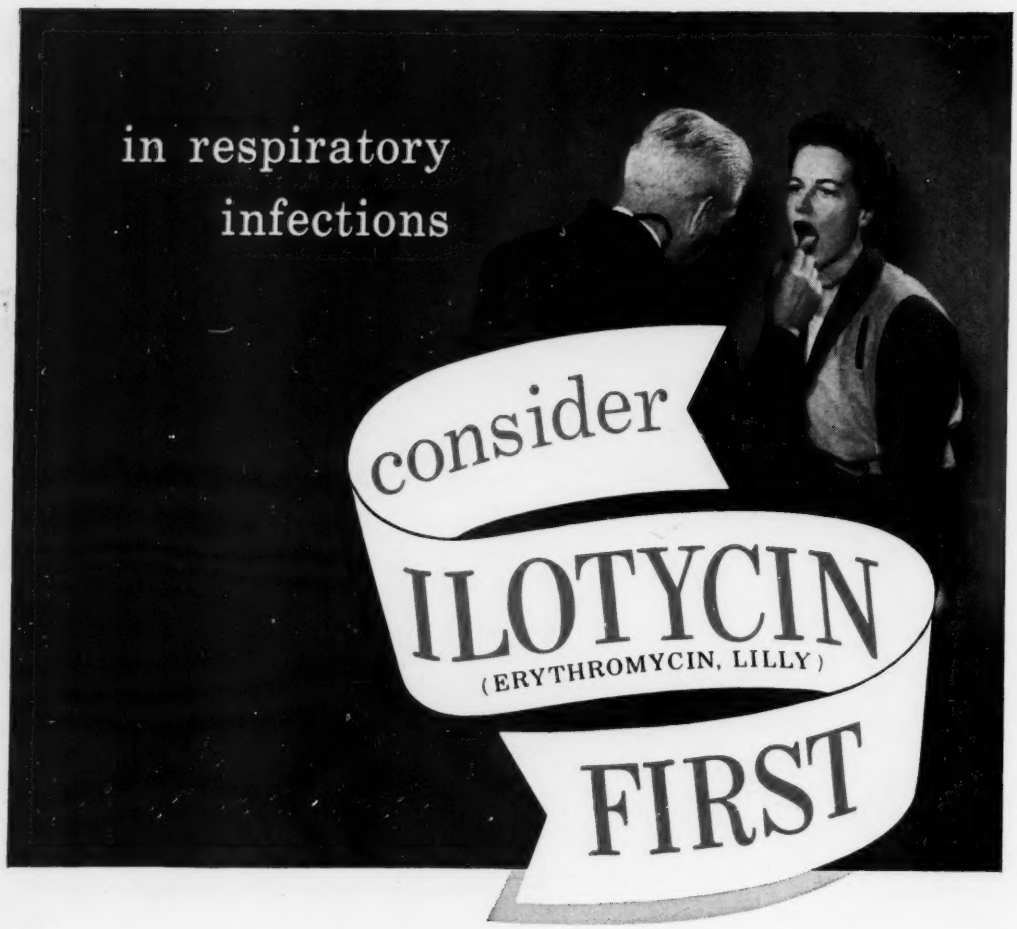

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Volume LVI FEBRUARY, 1955 No. 2

Tuberculosis Eradication in Kansas

J. Arthur Myers, M.D.
Minneapolis, Minnesota

On a number of occasions over the years I have been truly honored by invitations to meet with the Kansas Tuberculosis and Health Association. The first invitation was signed by that great pioneer in tuberculosis control, Dr. C. H. Lerrigo. Another came from Dr. Seth Cox, famous for tuberculin testing here and in the state of Washington. The present one came from Mr. W. W. Wilmore, with his keen insight and understanding of the procedures necessary to eradicate tuberculosis.

In Kansas, as in every other place, the tuberculosis situation determined the work to be done in each era of the evolution of the program. When this association was organized in 1908, many of the state's citizens were dying and many more were falling ill from tuberculosis annually. The disease was known to be contagious. If the great loss in health and life was to be checked, the contagious cases had to be segregated; hence you provided a sanatorium at Norton to which the first patient was admitted on February 8, 1915. The citizenry had to be informed; therefore, this organization waged an educational campaign which was enlarged and intensified as the years and decades passed. You promptly adopted and promoted every method of case finding that was of proved value. Professional workers throughout the state employed the best treatment methods known from decade to decade. Nowhere has treatment been better than at the Kansas State Sanatorium and at the University of Kansas. The only sound preventive measure, namely, prevention of spread of tubercle bacilli to the uninfected, has been practiced since the beginning of this organization.

Your accomplishments have been phenomenal. In 1908, 943 deaths from tuberculosis were reported. The peak was reached in 1913 when 1,088 died. Thereafter, the mortality decreased, first going slightly below 500 in 1937, below 200 in 1950, and reaching the all time low of 100 in 1953. Of the 100 who died last year, 80 were 40 years or older and 52 were 60 or beyond. Under the age of 25 years only six died, and death took no life of a teen-age girl or boy.

Thirty years before (1923), of the 764 who died 199 were under the age of 25, and 66 were in the teens. That year the mortality rate in Kansas was 41.8 per 100,000. Last year it was 5.1 and ranked among the lowest of the states.

I have not been impressed with the thought that we should cease to mention mortality. The reduced number of deaths in Kansas shows that the original objective is being attained. This alone much more than justifies past expenditure of time, effort, and funds. The public should have this accounting of the stewardship of past and present workers. On the other hand, people are still dying from tuberculosis. There are villages in this state whose populations do not exceed 100. If a tornado were to destroy all life in one of them, such consternation would prevail as to be headlined in the newspapers of this country. This is exactly what tuberculosis did in Kansas in 1953. This should not be ignored.

Along with the decline in mortality there has been a marked decrease in morbidity. The highest number

Presented before the Kansas Tuberculosis and Health Association, Kansas City, Kansas, October 7, 1954.

of cases reported in any one year was 2,620 in 1911. In 1921 to 1927, inclusive, the number was above 2,000 each year. After 1933 the number of reported cases did not reach 1,000 except in 1948 with 1,160. The smallest number since 1907 was 390 in 1953. Since 1947 the mortality rate has decreased more precipitously than the morbidity rate. This is probably due in large part to antimicrobial drugs which have at least postponed death in many cases, and also to intensive case finding work which has brought to light a sizable number of cases in the pre-symptom stage. However true the oft repeated statement that the number of cases of tuberculosis has increased or has not decreased satisfactorily, this does not apply to Kansas. In this respect also, the citizens of this state can take just pride in the accomplishment, and they have every right to know exactly how much morbidity and mortality have decreased.

In some places fear has been expressed that if the public is informed of the present low mortality and morbidity rates such a sense of security will develop that no need will be seen to continue to support tuberculosis work. It would seem that quite the contrary should be true. Accomplishments to date should justify the utmost confidence of the total population, which will insure support if they are appraised of the magnitude of the problem which lies ahead. In the first place, people have not stopped dying from tuberculosis, and last year the morbidity was nearly four times the mortality. A large amount of time, effort, and money will be necessary before the last death occurs and the last person has fallen ill. When this time arrives, there will still be a large tuberculosis problem in Kansas.

No one knows the magnitude of the present tuberculosis problem in this state. It is limited to those who are harboring tubercle bacilli. Very few of these people are sick tonight, and most of them appear entirely normal. If x-ray film inspection were made of each of the 1,965,000 citizens of Kansas, relatively few of those now harboring tubercle bacilli would be identified. However, all such persons have lesions, but most of them are not now large enough or do not have the consistency to cast visible shadows on x-ray films. Some lesions are located in the 25 per cent of the lungs not seen on the usual x-ray film, and others are located extrathoracically. Post mortem examinations by thoracic surgeons and pathologists have revealed that far more gross tuberculosis is missed than found by x-ray film inspection of the chest. Therefore, the mass x-ray survey is of little help in determining the true tuberculosis situation, that is, in finding those now harboring tubercle bacilli.

About 1937, Hammond believed that if an x-ray film could be made of the chest of everyone, most of those with cancer of the bronchi and lungs would be found in time to be treated successfully. Unfortunately, mass x-ray surveys have been disappointing in locating unmetastasized malignancies. Dr. Katharine R. Boucot recently reported on 142,156 persons from two photofluorographic survey units in Philadelphia between January 1947 and May 1953, and 37 per 100,000 were found to have cancer.

Among 100 consecutive cases of cancer she observed, 29 had had previous photofluorograms which were available for comparison. In 16 of the 29, lesions were overlooked on the earlier films, and in the remaining 13 no evidence of the disease could be seen at the time the previous films were made.

Twenty-five presented shadow-casting lesions which were not at first thought by the readers to represent cancer. Among the 100 cases, nearly one-half died from cancer within a year. Exploratory operations were done on 52, but only 30 were resectable, of whom only 5 (9 per cent) were alive at the end of three years after the first abnormal photofluorogram was found. Boucot stated that the chances of survey-detected cancer patients living for five years is about 10 per cent. She recommended that the search continue for new, more effective case-finding technics.

Gowen, reporting on 154,000 persons with survey photofluorograms at Springfield, Illinois, stated that only about 5 per 100,000 were found to have cardiac conditions requiring medical treatment or counseling. He pointed out that in such surveys attention should be paid to how many previously unknown cases are found which require medical attention and not merely how many cases of cardiac abnormality are found. In other places similar results have been observed; therefore, the by-products, namely, detection of cancer and heart conditions, which many hoped would return a good yield in mass tuberculosis x-ray surveys have for the most part been discouraging.

Considerable criticism has been leveled at mass x-ray surveys on the ground that so many reports included little more than the number of participants. In others, misleading reports have appeared. In some surveys, newspaper articles gave the impression that several thousand cases of tuberculosis had been found when in reality all abnormalities had been included, such as calcific deposit and diaphragmatic adhesions. Final examinations revealed that relatively few persons with tuberculosis requiring treatment had been brought to light, and many of them were already known.

Apparently it was necessary to go through these various stages and unfortunate circumstances over considerable time to evaluate mass x-ray surveys. We have profited greatly by this experience, and a gen-

eral impression now prevails to the effect that with few exceptions x-ray surveys should be limited to certain segments of the population such as elderly people, inmates of prisons, and institutions for the mentally ill.

The only method now available by which the magnitude of the present tuberculosis problem can be determined consists of testing everyone with tuberculin.

Inasmuch as the tuberculin test has such a dominant role to play as our sheet anchor in the eradication of tuberculosis, some of its values should be reviewed:

1. By the tuberculin test the presence of *tuberculosis is detected earlier* than by any other procedure. Indeed, within 6 to 8 weeks after tubercle bacilli invade the human body the disease can be diagnosed by this test.

2. There is a strong likelihood that the tuberculin test is our only *criterion as to when to begin treatment* that may actually cure tuberculosis. It is already being used quite extensively in this way. If antimicrobial drugs will ever cure tuberculosis in the strict sense of the word, they must be administered as soon as possible after invasions of tubercle bacilli occur. The presence of these invasions can be detected early only by the tuberculin test. At that time the lesions are located in various parts of the body, they are small and have good blood supply so that drugs in the blood stream may be expected to contact all tubercle bacilli. Tuberculous lesions later lose much of their blood supply, after which there is little hope of drugs contacting the tubercle bacilli. Although embalming solutions are germicidal and are introduced under pressure, they fail to reach necrotic tubercle bacilli containing areas in dead bodies. Indeed, living and virulent tubercle bacilli have been found in human bodies exhumed four months after they have been well embalmed.

3. It may well be that the tuberculin test will be our only *method of determining when to stop treatment*. There is reason to believe that when all tubercle bacilli are destroyed in a human body, the tissues will lose sensitivity to the protein of the tubercle bacillus and will fail to react to the tuberculin test. When this occurs antimicrobial drugs may be discontinued.

On April 3, 1953, John Adams, chief of the Department of Pediatrics, School of Medicine, University of California Medical Center, Los Angeles, wrote: "We are affiliated with a hospital where a low income group of patients is seen. We are making a survey there of positive tuberculins in children and families, and I have been intrigued by the idea of treating the early converter when known, regardless of symptoms or findings with antimicrobial drugs. I would like to follow these patients with tuberculin tests at three- or six-months intervals to see what the reconversion rate might be when the early converter is treated thoroughly."

This study which is now in progress, as well as one on animals, should determine whether it is possible with present chemotherapy to destroy all tubercle bacilli in a child's or animal's body so sensitivity to tuberculin is lost, thus indicating when drugs may be discontinued. Dr. Adams' scientific attainments admirably qualify him to undertake this study, scheduled to begin this fall. Tuberculosis workers throughout the world will have their eyes turned on his study and can be assured of strictly honest reporting of facts established.

4. The tuberculin test is our best *epidemiological procedure*. When a person is found to react characteristically to tuberculin, a contagious case is responsible. If the tuberculin reactor is a recent converter, regardless of age, the infectious source is not far away in point of time and often can be found by examining adult associates. Wood and Mantz found that tuberculin testing of kindergarten and first grade children, followed by examination of adult associates of reactors, resulted in a 10 times greater yield in discovery of clinical cases of tuberculosis than the yield obtained by mass x-ray surveys. Other workers have had similar experience.

5. The tuberculin test often *places responsibility in cases that come to litigation*. For example, a student nurse who had repeatedly been a nonreactor to tuberculin was placed in contact with a patient who had pulmonary malignancy. This individual also had contagious tuberculosis which was not detected until after several days of hospitalization. In due time the student presented a characteristic tuberculin reaction, but x-ray films of her chest were clear and remained so until some years later, when a shadow-casting tuberculous lesion appeared. An attempt was made to place the responsibility on the hospital where she was working when this gross lesion evolved. However, an industrial commission ruled that the hospital where she was in training when she became infected with tubercle bacilli was responsible.

6. Only by the tuberculin test is it possible to *determine the magnitude of the tuberculosis problem* in any group of people. This test readily detects those who are harboring tubercle bacilli, and it is they who constitute the problem.

7. Only the tuberculin test *determines* accurately and with reasonable promptness the *effectiveness of a tuberculosis control program*. Illness and death from tuberculosis are usually reflections of infections that occurred long ago and therefore should not discredit a control program that began after these infections occurred. Testing all persons in a community, a

county, or a state preliminary to establishment of an eradication program determines just what the situation is at that moment. After the program has been operating for five years, testing children born since its beginning and comparing the number of reactors with those among children from birth to five years before the program started, accurately determines the effectiveness of the first five years of the program. Similar subsequent testing and comparisons provide information that can be obtained in no other way.

Thus the tuberculin test is so important that without its use eradication of tuberculosis is impossible. With relatively few but unimportant exceptions, all persons, regardless of age, who are harboring tubercle bacilli will react to this test. Individuals who react characteristically have tuberculous lesions varying in size from those which are microscopical to those large and dense enough to cast x-ray shadows. Areas of disease too small to be detected by x-ray films may later evolve to such size and consistency as to cast visible shadows.

This work cannot all be accomplished at once, but it could be done in a surprisingly short time if it were introduced as a project for each community. Kansas has 1,641 physicians under the age of 70 years, of whom 939 are general practitioners. There are also 6,363 nurses in this state, of whom 3,584 are active. Immediate concentration of effort on these professional groups would yield good dividends. Many of them are willing and ready to enter the campaign enthusiastically. They need only to be informed of the magnitude of the present problem and their part in its solution.

With good organization, one person can administer the tuberculin test to about 300 persons per hour. Nurses administer this test as well as physicians. The intracutaneous method of Mantoux is most used in this country. The epidermal or patch method is also being employed extensively. Dr. Michael L. Furcolow is now attempting to improve the materials used in this test so it may be as efficacious as the Mantoux method.

Kansas has 400 veterinarians who have set the pace and deserve much credit in controlling tuberculosis in both animals and people. They have long used the tuberculin test as their sole diagnostic agent in case-finding. They knew that every animal which reacted characteristically to tuberculin possessed tuberculous lesions, even though many were microscopical. In 1924 they began countywide tuberculin testing of animals, and by 1935 all of the 105 counties had been completely tested and Kansas had met the requirement for accreditation.

In 1924, 17,522 cattle were tested and 1,575 reacted. Of these, 169 were so badly diseased that their carcasses were condemned to rendering tanks. In 1935 tuberculin tests were administered to 37,853 cattle, of which 3,276 reacted and 119 carcasses were unfit for food. There are now 4,341,000 cattle in Kansas, of which 271,379 were tested during the biennium from July 1, 1952, to June 30, 1954. Just 156 (0.06 per cent) reacted, of which 17 presented visible lesions and only 7 were condemned to the rendering tank. Thus veterinarians have "caught up" with tuberculosis so that rendering tank losses are exceedingly small, and in 127 of the 156 reactors one may assume that the lesions were not yet large enough to be seen by the naked eye at post mortem examination.

The veterinarians' tuberculin testing problem is more than twice as great as that of testing people. Although 1,740 cattle have to be tested to find one reactor, veterinarians continue to test. They know that eradication will not be achieved as long as a single animal reacts. If tuberculin testing were to stop now, this contagious disease could again become rampant among cattle. Thus, veterinarians are continuing to protect people against the bovine type of tuberculosis and can be added to the group of professional workers who have an important role to play in the present and future educational and case-finding program.

Tuberculin testing in any given area, or in the whole of Kansas, would quickly enable one to divide the population into two groups, those who are and those who are not now harboring tubercle bacilli. Thereafter, the attack on tuberculosis could be made in a scientific, practical, effective, and economical manner. In fact, a spot map of an area or of the state would show where the tubercle bacilli now reside.

Kansas is one of the states to which many of us have long looked as being among the first to eradicate tuberculosis. In 1945, Dr. Seth Cox, your executive secretary, wrote me about the tuberculin testing he was doing in rural areas. He tested 36,995 children ranging from pre-school through senior high school, of whom only 2.7 per cent reacted. Of the 2,006 children six years old or under, only 0.74 per cent reacted; among the more than 12,000 children from 15 to 18 years, inclusive, only 3.7 per cent reacted. Of the 2,873 adults tested, 16.9 per cent reacted. Dr. Cox published this material in September 1948 under the title *The Tuberculin Test: A Vital Factor in Tuberculosis Control.*

His work was done nearly a decade ago; with the fine control work since, one might expect a decreased incidence. These extremely low figures in rural areas probably do not obtain in the cities of Kansas, but even there the incidence of tuberculin reactors would probably be surprisingly low. Even in Kansas City, Missouri, Wood and Mantz periodically tested children and found the annual conversion ratio 0.8 per cent.

Three countywide tuberculin testing surveys in

rural Minnesota have revealed that about 22 per cent of the total population are harboring tubercle bacilli. A fourth county is now being tested. The distribution of reactors is most encouraging. Relatively few were among children and young adults, showing that this age group has benefited most by the tuberculosis control program. However, after the age of 40, in some areas as many as 40 to 60 per cent were found harboring tubercle bacilli. These are the generations who were children before control measures were well under way. They are still harboring tubercle bacilli acquired long ago.

One might anticipate that not more than 20 per cent of Kansas' 1,965,112 citizens are now harboring tubercle bacilli, and those show a preponderance in the upper age brackets. This is roughly about one in every five persons. It is among these individuals that the tuberculosis problem lies today, and whether the problem becomes larger or smaller will depend upon when these individuals are found and how they are managed. As soon as they are found by the tuberculin reaction examination, x-ray film inspection of their chests might be expected to reveal significant clinical lesions in 1 per cent or even less. Some composing this 1 per cent are already sources of contagion and need isolation and treatment. Others have demonstrable active clinical lesions in the precontagious stage, most of whom are apparently in excellent health. For the most part they can be treated so effectively as to prevent their disease from becoming contagious or to cause illness.

Among the remaining 99 per cent of the tuberculin reactors, an annual crop of clinical lesions will evolve to be found and managed. This necessitates at least annual examinations which, if well done, will detect the slowly growing lesions before they produce symptoms or become contagious. By proper management the tubercle bacilli these persons harbor will remain corralled. *Failure to examine tuberculin reactors periodically in the past has been largely responsible for the preponderance of cases that are advanced when found.* There can be no relaxation in these annual examinations as long as tuberculin reactors are alive.

Principles involved in such a program have been firmly established. This is the only method that is economically sound. It excludes waste of time, effort, and funds on four citizens in every five who do not harbor tubercle bacilli and thus cannot have tuberculosis at the moment. Nevertheless, some of the four uninfected citizens in every five are still in danger because there are in this state unfound persons with uncontrolled and contagious tuberculosis who are certain to infect them. There are others whose disease will become contagious before they can be found. Therefore, it is imperative for some time that all present nonreactors be tested periodically in order to find those who do become infected. The possibility of curing tuberculosis in recent convertors emphasizes the importance of this procedure.

This modern program is so different in its emphasis from that of the past that a large task lies ahead to change the thinking of the public in order to maintain continued support. Until now we have talked about finding lesions large enough to cast visible x-ray shadow, lesions that cause illness or liberate tubercle bacilli. If a survey did not reveal such lesions, it was thought to be unsuccessful. Now our citizenry must know that the characteristic tuberculin reaction indicates the presence of the forerunners of such lesions and that by finding these precursors at the proper time we may be able to destroy the disease.

Once the citizens of Kansas are informed that the concept of just controlling tuberculosis has been abandoned and has been replaced by refined methods leading to eradication, complete support will be assured. We may then expect the buying of Christmas seals to be increased and all other necessary support to be intensified. It is obvious that this is a momentous program, but it must be so because of the magnitude of the problem.

Through the efforts of the past, tuberculosis in this state has been so reduced that your sanatorium waiting list of a few years ago has been absorbed and some of your 499 beds were vacant in 1953. In fact, at the Norton State Sanatorium, with 445 beds, the average daily population in 1953 was 393. This fine showing may not be improved or even maintained for a while. The number of persons requiring hospitalization may increase.

A high percentage of displaced persons are harboring tubercle bacilli, and a considerable number have already become clinical cases. There is evidence that much tuberculosis has been brought from other countries by war veterans. Tuberculosis is notoriously a relapsing disease. Therefore, some who have been treated successfully, even long ago, will again require hospitalization. A sizable number of cases could be cited whose disease broke down a quarter and a third of a century after it was successfully controlled. We do not know what the relapse rate will be among those now being treated by antimicrobial drugs and resectional surgery. Many of them may again require institutional care. Among the present probable 20 per cent apparently healthy tuberculin reactors are many who will have clinical tuberculosis in their remaining years.

Tuberculosis has been only wounded. A wounded animal is most dangerous. Many a person has lost his life because he did not sense the danger on approaching such an animal.

Nowhere is tuberculosis treated more satisfactorily than at the Kansas State Sanatorium and the Thoracic Diseases Unit of the state university. Even if the de-

mand for beds markedly decreases over the next few years, it would seem unwise to close or convert to other uses any of the hospital and sanatorium beds.

In appraising the citizenry of the new emphasis on tuberculosis, special techniques can be helpful. One of proved value consists of *certifying schools with reference to tuberculosis control work in progress.* This is a project that was adopted about a decade ago by the Committee on Tuberculosis of the American School Health Association. It has been so thoroughly tested that there is no question about its value in stimulating interest, disseminating information, and promoting activity against tuberculosis. Qualifications have been established by which individual schools and systems of schools may be certified. Actual participation of school children and personnel is the best means of conveying information.

A subcommittee has been appointed in each state to work with its state tuberculosis and health association. Whenever a school qualifies, an official certificate is issued bearing the name of the school, signed by the president and executive secretary of the American School Health Association, the chairman of the State Subcommittee, and the executive secretary of the State Tuberculosis and Health Association. In one state more than 2,000 schools have been certified, and many others are about to qualify. Several other states are starting to certify schools this fall. It is almost unbelievable to what length parent-teachers' organizations, school children, and entire communities will go to win certificates for display on the walls of their schools.

When grade school children react, a careful search is made among their adult associates to find the responsible case. When high school students and personnel react, they are promptly examined for clinical disease. Both have yielded good returns. In some communities practically every person in and out of the school system, young and old, has been examined in the process of qualifying schools for certification.

I know of nothing else that would enlist the interest and support of the citizenry of Kansas so quickly and so effectively in the tuberculosis eradication program. If your 285,444 grade school children, 92,260 high school students, and 17,823 teachers were put to work on such a program, the entire citizenry would soon be ready for the all-out eradication procedure.

The Future of the Private Practice of Medicine

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I thank the members of your committee for inviting me to speak here tonight. It is a pleasure to be in Kansas City once again, and I congratulate your leaders in the university and in the medical profession for their outstanding efforts in solving some of the problems of medical care in their local communities. Your programs of continuing education are examples that can be followed and initiated with profit by all universities and all medical societies.

The title of my paper may appear to be very ambitious indeed, but it is always stimulating for the physician to look ahead and to attempt to make a forecast of the future. Prognosis is one of the most important functions of the physician. It is one that changes from time to time with advances in medicine and with changes in environment. It is a subject that needs continuing exploration because it is beset by uncertainties.

I believe that you will agree with me when I say that it is extremely hazardous to make any predictions concerning the future of medical practice. But the subject is not new. The thoughtful person always studies the past because it is as Shakespeare told us—the prologue. The future of medicine and its practice has been the subject of considerable debate, especially in the past 50 years, and it has been particularly lively in the past 20 years.

The organized profession of medicine has turned attention periodically to the current and future trends of private practice in the United States, and it is well to review the subject on a continuing basis. The

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objective of such reviews is to determine how the best medical care can be provided for the people in a changing environment.

In 1921, the late Frank Billings, one of America's great physicians, wrote an essay, "The Future of Private Medical Practice," and with your permission I shall quote a paragraph from this paper.

"In the evolution of modern life, society has been and still is characterized by financial greed and by extravagant expenditures for luxuries and pleasures which appeal to the physical rather than to the spiritual man. The cities afford opportunity for display, social pleasures, and for possible success in a professional and financial way. This tempts migration of the professional and the business man, including the young men of the farm, from the country to the city. This migration has increased within the last few years in spite of the more livable conditions of village and rural life, through the advantages of rural free delivery, the interurban trolley and motor cars. At the present time more than half the population of the United States is urban. Thus there is an excess of physicians beyond the need of the city public, and a dearth of medical men to supply the need of the rural population. This breeds discontent and disappointment in the medical profession in the city, and the rural public suffers from the need of a sufficient number of doctors. The country physician lacks modern facilities for diagnosis and for the needed hospital treatment of his patients."

Many of the statements made by Dr. Billings in 1921 are applicable today.

Medical practice in any community reflects the health knowledge of the people, the accessibility of facilities and health personnel, the education of the physician, and the economic security of the people. In the past three decades, phenomenal changes have occurred in all of these factors that influence medical practice. The changes have been so rapid and so numerous that it is difficult for either doctor or patient to assimilate them completely.

The recent trends and shifts of emphasis in medical practice suggest to me that the physician and the profession, working closer with laymen who want and need their advice and help, will determine the nature of medical practice in the future as in the past. However, members of the medical profession will determine their own future and destiny only if they continue to consider themselves a part of the general public. They must not consider themselves men apart because this is one of the great perils of professionalism.

The profession must be devoted to the welfare of the public and continue its practice and pursue the art of medicine as a public service. The tradition of the medical profession is a duty to the patient, to the profession, and to the public. Professional service to the public is authoritatively declared in the codes of professional ethics that are taught by precept and by example, and they are made effective by discipline of the organized profession. Codes of ethics are for the protection of the general public and not for the protection of individual doctors or vested interest groups.

All physicians have rights as citizens and as members of a profession. But, in addition to rights, the medical profession has certain privileges and prerogatives which are allowed by the people and enjoyed under the law. These privileges are permitted by the public by reason of confidence in the integrity of the profession and in the belief of its general beneficence and by right of specialized knowledge. The medical profession exists only as the people allow it to maintain its prerogatives. We should be acutely aware of these privileges and appreciate what the profession enjoys. Those who are conscientious will not take advantage of these privileges. Those who are thoughtless—and certainly those who are not entirely honest—will do so.

I have already stated that medical practice has changed greatly in the past 50 years. These changes are due to many factors such as increased knowledge due to research, improved medical education, the application of new knowledge, extended public health practice, the change in the relationship between the practitioner and the specialist, the growth of health insurance, group practice, and the development of the hospital and the health centers as focal points for the distribution of health services.

At present, the profession is striving to fuse the art of healing with the new science of medicine. Each of you individually and through your profession is contributing toward this fusion. You are doing this in your work by improving public relations, physician-hospital relationships, voluntary health insurance, and the level of public understanding of total health problems. As individual practitioners you are making the new medicine of today a reality by combining the healing art, which requires sympathetic understanding of the patient's personality, his strengths and weaknesses, with the application of medical technology in clinical practice. Similarly, in your dealings with community problems, as a group, you are using your talents as physicians and as scientists in attempting to find solutions to the economic and social problems of medical care.

Tracing some of the changes that have occurred in the private practice of medicine, in hospital care, in methods of financing medical care, and in medical education and research will help to indicate the values of the past that we must all strive to preserve or restore in the medical practice of the future.

PRIVATE PRACTICE OF MEDICINE

Among the most significant changes in the private practice of medicine are the deterioration in the competitive position of general practice, the increase in number and variety of specialists, and the emergence of group practice. I shall briefly consider the impact of each of these developments.

The Family Doctor or Personal Physician. In 1923, about 1 in 10 of the 146,000 physicians in the United States limited his practice to some specialty. In 1949, the proportion of full specialists had increased to 3 in 10, and today it continues to rise. The decline in the resulting proportion of physicians who gave all or part of their time to general or family practice is perhaps one of the most deplorable developments in the period and may well be at the root of many of the problems of medical care today. Patients complain that the doctor has no time to listen to what they have to say, and they wish that the doctor would look at them more and the x-rays less.

In the family doctor of the past the healer predominated, and though his scientific knowledge had grave gaps by present-day standards, his advice, guided by his understanding of the patient and his family setting, happily altered the patient's life while nature cured the ailment. Nostalgically the patients of today look to all physicians for the same type of sympathetic interest in their personal problems; yet at the same time they want the best in modern scientific medicine. The family doctor of 30 years ago would have been puzzled at the need to write books with such titles as "Patients Are People" and "Patients Have Families." Increasingly, the doctor of today and tomorrow, as healer and scientist combined, will find satisfaction and reward in family practice, for medicine is being guided back to primary preoccupation with a person as a human being.

I foresee the personal doctor of the future as the most important single unit in medical care. He will be the well trained internist, because the internist of today is not a specialist in the strict sense of the word. Like the family doctor of the past, the family physician of the future should serve as health adviser and health educator and as a leader in developing the health resources of the community.

He will differ greatly from the family doctor of the past, however, in the resources at his command. In addition to his black bag, he carries with him the potentialities for ready access to top-notch consultants in the medical specialties, to hospitals with their resources, and to a wide range of preventive and rehabilitative services. Through him, the patient will be assured continuity of care, adequate interpretation of his health needs, and understanding of his problems as a person, without sacrifice of the quality of care he receives. In good medical care there is no substitute for the personal doctor-patient relationship.

Specialism. The specialist is and will of course remain an essential, necessary, and important person in medical care. As medical knowledge expands, new specialties will emerge, each requiring years of study to assimilate and augment techniques of diagnosis and treatment. In the future, however, specialists can be used more wisely if their services are properly correlated with those of the family doctor.

In any discussion of the problems of specialism and the future of medical practice, it is essential that the relations of the specialist and the practitioner be examined on a continuing basis. It must not be forgotten that in discussing this subject, there is a third person to be considered; namely, the patient. I submit that his rights take precedence over those of the other two. The correctness of this conception will be generally admitted, but I believe you will agree with me that in actual practice it is often overlooked.

A large part of the current discontent with medical care on the part of the patient stems from the fact that the relations between the specialist and the nonspecialist are not always such that they are in the best interests of the public and the patient. The discussion of these questions must be lifted from the level of a trade or business to that of a profession; that is to say, how can the relations of the specialist and the practitioner be improved so that the patient or the public will be the prime consideration. These are matters that the profession as a whole must solve. The specialist must place himself in the place of the family physician and vice versa, and then they must both place themselves in the place of the patient. When this is done, many of the difficulties of conduct, ethics, fees, relative glory and distinction, status and rank as reflected in special societies, associations, colleges, academies and certifying boards will disappear.

Many of our present problems originate from the isolation of the various specialists from each other and from a lack of physicians who interpret and integrate the several fields.

The family or personal physician is the one to advise the patients about all health matters. He is the central figure. He utilizes the services of the specialists when they are needed.

Group Practice. The teaching hospital, since the beginning of scientific medicine, has demonstrated the value of group practice. All of the teaching of medicine in our medical schools centers around the principle of the group approach to the care of the patient. It has assembled under one roof, for both bed-patients and out-patients, the diagnostic and therapeutic equipment and personnel needed for the care of the sick.

Group practice for home and office care is a more recent but equally significant development. It achieves economy by avoiding duplication of expensive equipment and ideally provides the link between the personal physician and a wide range of specialists. One of the objectives of group practice is to devise a means by which the best interests of the public are conserved and a working plan by which patients of moderate means may receive the benefit of the skill of specialists.

The upward trend in group practice from a total of 239 groups in 1932 to an estimated 500 in 1950 will undoubtedly continue as small hospitals and health centers, linked with the facilities of the larger medical centers, attract both general practitioners and specialists to the communities that now lack medical resources.

There are many different types of group practice, and experiments in group practice coverage are being carried out in some areas of the country in an attempt to meet the problems of medical care as they exist in a local community. No group enterprise in the practice of medicine will be successful unless the patient is the prime consideration, and no group enterprise will be successful unless it meets the needs of a local community. The group must be tailored to meet such needs. They will naturally vary from one community to another.

There are dangers connected with group practice. To mention a few: there is a danger that a machine-like routine instead of individualist investigation may be made; there is danger that the results of various technical examinations made by individual members of the group may add very little except expense to the patient and that they will not be reviewed by some sane, judicial physician who will see that this assembled diagnosis is made up of many parts joined together as a whole; there is danger that the practice of medicine may be placed on a commercial basis—that the group may become a profiteering partnership and that the profession of medicine may further degenerate into a trade.

There are other questions that give many grave concern with respect to the development of group practice, the most important of these being what will be the relationship of the general practitioner or the family physician to the group. Will he be a member of the group or will he be in good standing with it? Will he be able to return to his position as family adviser to the patient who seeks the services of the group? Will he have rights in the group hospital? What will be his status in the community hospital? Is it possible that the family physician will shrivel up into nothing more than a physician who makes a tentative diagnosis and who, like the admitting officer of the out-patient department, assigns the patients to the proper specialist? Is it possible that the general practitioner will become merely the emergency physician called in for minor ailments or when the specialist is not available on Wednesday afternoons, nights, and week-ends?

For group practice to be successful it must make a contribution toward providing the best medical care at a cost that the patient can afford to pay. The position of the family or personal physician must be maintained as one of honor, dignity, and remuneration. He must be an honored member of the group and not what so many specialists refer to as a "feeder." He must be more than the ordinary or emergency doctor who responds to calls in the night, sews up the scalp wounds, or prescribes the sleeping pills or the sedatives for the maladjusted.

Here, again, I submit that in all group enterprises, the welfare of the patient comes first. Good relations must be established between specialist and non-specialist and maintained at the highest professional level.

HOSPITAL CARE

Because of the closely integrated facilities and personnel provided by modern hospitals, the volume of hospital care in the United States has increased enormously in the last 20 years. Admissions to registered hospitals in 1934 represented 61 persons per 1,000 population. By 1952, the admission rate had reached 121.4 per 1,000 population. Along with this increased utilization of hospitals, the costs of medical care have mounted and are continuing to rise.

Since hospital care has had a great impact on medical practice in the past 20 years, and since it has had a profound effect on the total costs of medical care, this aspect of medical practice needs to be explored in an intensive manner. Hospital-doctor relationships need to be studied in a continuing manner with the patient receiving prime consideration. We have a fourth party entering into these problems; namely, the insurance companies or the hospital service organizations, and they have had an impact on medical care and will continue to have an effect on medical practice as it is carried out in hospitals. The Commission on Financing Hospital Care and the Conference on the Care of the Long Term Patient give many guide lines to possible solutions of these problems.

I wish to turn attention now to the subject of medical care insurance and its impact on the future of the private practice of medicine.

HEALTH INSURANCE

In the last 20 years health insurance has emerged as an almost revolutionary factor in medical practice. In the main, health insurance is concerned with the method of paying for health services. Whatever one's

personal and professional views of this new influence on medical practice, one must recognize its accomplishments and its shortcomings, its potential values and pitfalls in the organization and distribution of medical services as well as in methods of financing medical care. I maintain that some forms of health care insurance are here to stay. In the final analysis, the type of health insurance that will be available will be determined by the public, because it is vitally interested in health protection plans.

There are many evidences that, lacking adequate utilization of chronic disease institutions and nursing homes, home care, out-patient care, and care in doctors' offices, the load on hospitals will continue to mount, and hospitals will be called on to provide services that could be given equally effectively and more economically elsewhere. For long-term care of chronic diseases, for example, and for care of infirm aged persons, nursing and convalescent facilities and home-care programs, if linked with any needed hospital care during acute episodes, can solve many of these problems.

Estimates of the Health Insurance Council indicate the rapid growth of voluntary health insurance in the past decade. Some kind of insurance against hospital expense was carried by nearly 98 million people in the United States in 1953, representing nearly 3 in 5 of the population. In 1941, only about 16 million were covered by hospital insurance.

In addition to their hospital insurance, some 75 million people had some kind of insurance against surgical expense in 1953, as compared with less than 7 million in 1941. The number who have additional insurance protection to help meet the cost of physicians' services for other than surgical treatment has risen from about 3 million in 1941 to 36 million in 1953.

For the most part these forms of protection against some of the expenses of medical care are limited to care in hospitals. To the extent that they are so limited, they tend to increase the pressure for hospitalization when out-patient or home care, or care in less expensive facilities, would be equally advantageous.

By and large the present provisions for voluntary health insurance have several serious gaps. I might list a few for your consideration, confident that you and all others concerned with health problems will work earnestly and wholeheartedly toward methods of extending this new form of financing medical expense to wide effectiveness and to more people.

1. The effect of health insurance on the utilization of physicians' services for periodic health examinations and home and office care should be extended. A 1952 Medical Economics Survey found that private practitioners see nearly three-fourths of the average daily number of patients in their offices. Home visits and hospital visits represent about one-tenth and one-fifth, respectively, of their daily patient load. The full value of voluntary health insurance cannot be realized until it is designed to strengthen and broaden the doctor-patient relationship in health and in rehabilitation as well as in serious illness.

2. Ways must be found to extend health insurance protection to individuals who are missed by the principle of group enrollment. Also ways must be found to cover more of the elderly, the retired people, the pensioners, the unemployed, and those with low income.

3. Ways must be found to expand and intensify rehabilitative efforts so that persons suffering from disabling chronic illness and defects may be restored to usefulness.

I have indicated that the people of the United States are interested in health insurance because they know that the costs of illness have been rising and they know that these costs are unpredictable. They want to buy protection against these unforeseen contingencies so that they may be able to meet all or a major part of the cost of illness when it strikes and avoid financial catastrophe.

There are two prevalent views concerning the types of health insurance that will cover the needs of the people. One is compulsory health insurance, operated by a state, local or central government; the other includes all voluntary prepaid plans, operated by health service organizations, private insurance carriers, and co-operative organizations or societies. One of the strongest bulwarks against a compulsory health insurance plan is the further development of voluntary plans. If these plans are to meet the test, they must cover more people, and the benefits must be increased. Also, the practice of medicine must be organized so that the services are rendered in the most efficient and the most economical manner. Health protection plans are not designed to increase the cost of medical care, but they are designed to help people pay for sickness through the insurance principle; namely, the spreading of the costs of illness among covered groups by prepayment.

The present administration has rejected compulsory health insurance as a means of meeting the problem of financing the costs of medical care. It proposes to encourage and stimulate private carriers to experiment with untried risks by a sharing of these risks through a reinsurance fund. The proposal is designed to speed up the coverage of more people who can afford to buy insurance and to make plans available that will provide larger benefits, plans that will cover major expenses for major illness, plans that will provide more adequate benefits for short-term, high-cost

illness, plans that will reach individuals and groups in the less densely populated communities who are difficult to enroll at present.

The success of prepaid voluntary health insurance in the future will depend upon whether it can provide sufficient benefits to the people to make them feel economically secure when sickness strikes. Any plan that fails to give the needed economic security for health protection by a voluntary method will lead to the other path, namely, the compulsory method. We need to build on our voluntary plans in order to take the offensive against the compulsory plan.

ROLE OF RESEARCH AND EDUCATION

The role of the historian is an analytic but relatively passive one. In describing the past he can be content to point out the whys and wherefores of the present. The role of the soothsayer is equally circumscribed and relatively easy so long as he and his hearers do not survive to disprove his prophecies. We in the medical profession today, however, must be both. As teachers, practitioners, research workers, and community leaders we *build* the future of medicine from our knowledge and experience of the past.

Our resources in this task are many. As of the present, we can count on public and private support for medical education and research so that the physicians of tomorrow will be superlatively equipped in the art and science of medicine. We have an increasingly health-conscious and health-informed public with whom to work. We have the highest standard of living in the world and even in our own history. We have the aid of many groups in our joint endeavor. Above all, we have elected representatives and public servants in Washington who are dedicated to the goal of improving the health and welfare of Americans without weakening their capacity for self-help.

Medical research is bit by bit encroaching on the frontiers of the unknown and is helping us solve many of the mysteries of the chronic diseases that constitute our most serious health problems.

Medical education is being increasingly oriented toward the prevention of illness and the fusion of the art of healing with the science of medicine.

Experience in rehabilitation is proving dramatically that long-term invalids and helpless cripples can not only live with their disabilities and limitations but live useful and satisfying lives.

In summing up, in this talk on the future of the private practice of medicine, I have touched on such topics as the role of the family doctor, the relationship between the specialist and the non-specialist, the impact of group practice, the increased utilization of hospitals, prepaid health insurance plans, and medical research and education. All of these factors will play a role in the future as they have in the past, but the emphasis will be different. The medical profession must take the lead in all of these matters and it must provide the best medical care for all of the people. This is our duty; this is our tradition. In our practice, we must never forget that the profession is devoted to the welfare of the public and that we practice the art of medicine as a public service. If we remember these simple truths and apply them, the future will be secure and the people and the profession will retain maximum freedom.

CORRECTION

Shepard Shapiro, M.D., author of a paper which appeared in the December 1954 issue of the JOURNAL, "The Hypoprothrombinemia-Inducing Activity of Warfarin Sodium (Coumadin Sodium)" has advised that an error was made in identification of the structural formulae. The formula labeled "Dicumarol" should be labeled "Tromexan" and vice versa. The formulae, reproduced from a drawing, were published on Page 688.

Panhypopituitarism Is Easily Missed

Mark Dodge, M.D., Arthur W. Robinson, M.D., and Arnold V. Arms, M.D.

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There would perhaps be little reason to rehash the problem of pituitary insufficiency if the diagnosis of this condition was usually obvious.[1] The converse appears more probable, however, and we should like to present three cases which illustrate various facets of this complex syndrome.

Each of the following people to be described had recognizable diagnostic signs which were present from one to six years prior to the discovery of their pituitary lesions. This is urgently important because two of them suffered irreparable damage—one to vision and one to psychic function, and the third was an inadequate person during the time she was untreated.

CASE HISTORIES

1. Mr. W., Case 311, white male. When seen first in March, 1953, he was 40 years of age. His complaints were those of weakness, cold intolerance, gradual loss of body hair, and loss of libido and potentia for the past three years. In addition he felt that he had "an odd smell" about him, and he believed that his acquaintances noticed this and shunned him to a certain extent because of it.

Past history indicated that the patient had not felt really well since 1936, at which time a positive serology had been discovered and arm and hip shots were given for six months. In 1946 the patient was treated by liver injections and hydrochloric acid by mouth for a rather severe anemia, and he was told that probably he was losing blood from hemorrhoids. He was seen at another institution in 1947 because of an acute illness characterized by high fever, stiff neck, and delirium. A spinal tap at that time revealed 95 lymphs, protein 120, and a negative colloidal gold curve. The spinal fluid Kolmer was reported as doubtful. There was diminished visual acuity in the left eye, and the left pupil was dilated and fixed. The diagnosis was acute sinusitis.

On examination in March, 1953, the patient was noted to be markedly pale, the skin was dry, and the reflexes were typically myxedematous with a slow rise and fall best demonstrated in the biceps tendon. The testes and prostate were atrophic. The optic discs showed bilateral pallor, and the body hair was markedly diminished. Neurological examination was not remarkable. X-ray of the skull indicated thinning of the floor of the pituitary fossa and enlargement of the fossa, together with an irregular area of calcification superimposed on the pituitary area. I-131 uptake, using 24-hour count over the thyroid, was 3 per cent. Visual fields were normal. The patient was dismissed on thyroid, cortisone, and testosterone and, because of a continuing delusion of a bad odor, x-ray treatment was given the sella. There has been no subsequent change in the patient's olfactory delusion. However, his general health is remarkably improved with a normal blood count, changes toward normal in the skin, and normal libido and potentia. The March 1953 laboratory reports are summarized in Table I. See Figures 1 and 2.

Figure 1, Case History 1. Note the moderately enlarged sella. There is also supersella calcification in this film.

TABLE I

	HB	*RBC*	*BMR*	*CHOL*	*17 KS*	*CSF Protein*	*CSF Cells*	*Water Test*	*Fasting BL Sugar*
Mrs. L.	11 gm.	3m	—40	204	17 mg./24 hrs. (on ACTH)	15 mg. %	2	Part II 20	85
Mr. E.	12 gm.	3.2m	— 6	200	not done	30 mg. %	3	Part II 10	75
Mr. W.	10 gm.	3.4m	—17	260	2 mg./24 hrs.	50 mg. %	1	Part II 10	80

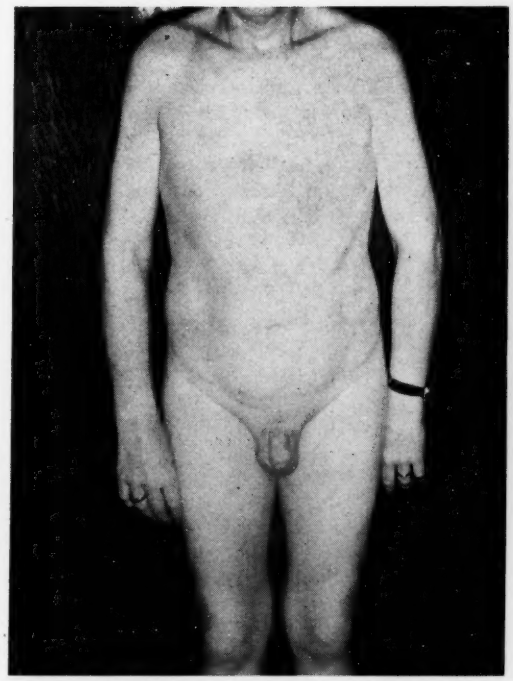

Figure 2, Case History 1. Note the pale, zombi-like appearance typical of panhypopituitarism, also the absence of genital hair.

2. Mrs. L., Case 4974. The patient is a 47-year-old married white woman who was first seen in January, 1954, complaining of fatigue, cold intolerance, dryness of the skin, and amenorrhea. History indicated that the patient stopped menstruating suddenly at age 40, without hot flashes and with no periods since. In 1948 she developed an acute left frontal headache and was hospitalized as an emergency in the city hospital, where a diagnosis of encephalitis was made. The spinal fluid at that time showed only a moderate red blood count. She made an uneventful recovery from this illness but since then—that is, for the past seven years—has noticed increasingly the complaints listed above. She had had various symptomatic treatments prior to being seen in 1954, but no definitive diagnosis had been made.

She illustrated the typical appearance of panhypopituitarism with a pale, puffy skin, markedly decreased body hair, and considerable lethargy. Visual fields and neurologic examination were negative. An x-ray of the skull revealed an enlarged sella. The patient was dismissed on the usual end-organ treatment of estrogen, androgen, cortisone, and thyroid. In addition she was given ACTH with the idea that perhaps the latter drug is more physiologic in these cases than cortisone.[2] She improved rapidly and was soon able to take the responsibility of running a nursing home which she had previously had to give up. This was important because she is responsible for the education of her two children and is their sole support. Laboratory studies prior to treatment are in Table I. See Figure 3.

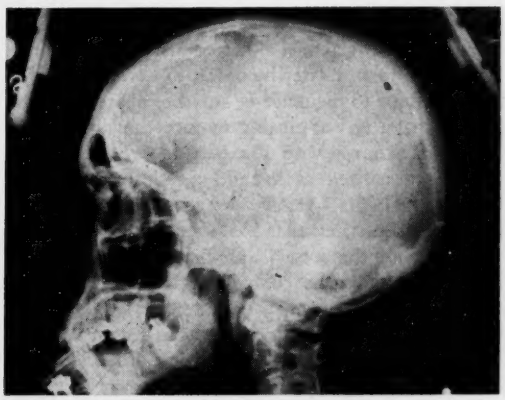

Figure 3, Case History 2. Note the enlarged sella and the posterior inferior erosion of the latter.

3. Mr. E., Case 3281. The patient is a 40-year-old white male who was first seen in August, 1952. At that time he was complaining of progressive loss of vision and impotence—the latter had been present for the previous five to six years.

He had served successfully as an enlisted man in the Army and had an honorable dismissal in 1946. He had consulted a reputable oculist in 1947 because of failing vision. He was told at that time that he had optic atrophy, but no further recommendations were made. He was married in 1947 and had never been able to have intercourse because of impotence. He stated that in adolescence he had been able to have satisfactory intercourse so his present complaints were a definite change with regard to past history.

Examination in 1952 revealed the typical facies of panhypopituitarism with a pasty, dry, thin epidermis, a rather dull look, and myxedematous reflexes. Body hair was scanty throughout. The testes were somewhat small, and the prostate was definitely atrophic. There was optic atrophy, worse on the right than the left, and marked contracture of the visual fields, particularly temporally.

An exploratory craniotomy was performed, and the neurosurgeon exposed a golf-ball-sized mass in the region normally occupied by the pituitary gland. On aspirating this mass the surgeon obtained approximately 30 cc. of what appeared to be venous blood. It was decided by the surgeon, although the lesion by x-ray and clinically was thought to be a craniopharyngioma, that the vascular connections made it impossible to remove. Therefore, the right optic nerve was sectioned in order that the optic chiasm might swing to the left and preserve vision in the left eye, and the

craniotomy was closed without further surgery. Postoperatively the patient was placed on the usual regimen of cortisone, androgen, and thyroid and shortly began to develop whiskers and body hair and experienced libido and potency that he had not enjoyed in years.

An interesting sequel occurred which was entirely unforeseen in that after he began to develop sexually his wife came to the office in an acute depression. She related that she was unable to face the prospect of sexual intercourse with the patient, whom she apparently visualized as a child physically and emotionally, which is actually what he was during their marriage. She stated that if the patient continued to develop along the normal lines that he was indicating, she would either be compelled to divorce him or would become a mental patient herself. The situation was further complicated because the patient's vision was only enough to enable him to get around and because his wife always had been the breadwinner in the family; the patient would be left high and dry without means of support if they were separated.

Needless to say, this type problem produces a dilemma for the doctor that is difficult of solution. Should one deny a male the treatment which makes him relatively normal because the wife prefers to have an impotent husband, or should one treat the male and allow the wife to become mentally ill—or, perhaps more properly, more mentally ill—and produce a situation which would eventually end in divorce? See Table I for pretreatment laboratory work. See also Figures 4 and 5.

Figure 4, Case History 3. Note the enlarged eroded sella and the ring of supersellar calcification. This is typical of a craniopharyngioma.

COMMENTS

In thinking about the philosophy of how one avoids missing diagnoses, we believe that we usually recognize a syndrome as one would greet an old friend—that is by familiarity. But lacking this, one must be able to synthesize the possibilities from any given facet. For example, pallor is the hallmark of panhypopituitarism; in fact, patients afflicted with this disease are unable to become tanned by the sun. Therefore, if we will take the time to look further for a cause of pallor when the usual reasons for it do not fill the diagnostic requirements, the true facts may become apparent. Thyroidal myxedema causes the same type pallor. However, one must be alert to search for pituitary lesions as myxedema may be but a part of panhypopituitarism.[3] Other cardinal features of the latter syndrome are amenorrhea, impotence, loss of whiskers, axillary and pubic hair, headache, tunnel vision, and often refractory anemia.[4, 5] The genital organs may be atrophic. Cachexia is not often present.

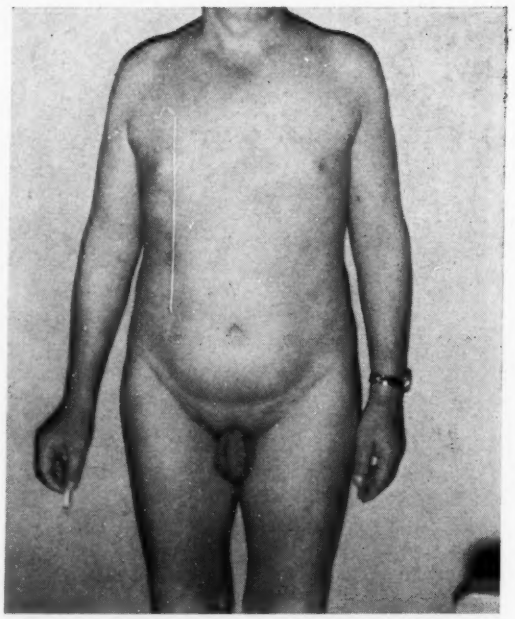

Figure 5, Case History 3. Note the pallid, puffy appearance characteristic of panhypopituitarism. The absence of axillary and genital hair is plain.

The common causes of panhypopituitarism are obviously any tumor, including craniopharyngioma, or vascular destructive process which impinges in or on the pituitary. A not so obvious cause is infarction of the pituitary following post partum deep shock, called Sheehan's syndrome. A facet—as above—of this disease is the failure of pubic hair to regrow after being shaved for delivery.

Laboratorywise one needs to realize that the positive findings will reflect only the variable parts of the pituitary which are destroyed. For example, if the thyrotrophic moiety of the pituitary is involved, there may be severe myxedema. Interestingly the serum cholesterol is seldom elevated in pituitary myxedema so that the finding of a normal cholesterol with a low basal metabolic rate should suggest hypopituitarism.[6] If, conversely, the adrenotrophic portion

of the pituitary is destroyed, there may be hypotension, fasting hypoglycemia, insulin sensitivity, but seldom electrolyte changes and never the Addisonian pigment. The water test (which can be run in any hospital) is almost invariably positive. There may be lymphocytosis and eosinophilia. The 17-ketosteroids are depressed.[7] Urinary follicle-stimulating hormone is below normal. Of course x-ray findings of an enlarged sella are most helpful; however, the sella may be normal as it is in Sheehan's syndrome.

Treatment is not difficult once the diagnosis is made. It is most important to know that cortisone or ACTH must be given before thyroid is started. If the reverse order is followed, results may be disastrous. This is so because apparently thyroid medication in the presence of myxedema and decreased adrenal function produces stresses which may be fatal. Lacking a pituitary preparation which is effective, we are forced to give end-organ treatment except for ACTH. We use 10 units of ACTH gel daily or 12.5 mg. cortisone twice a day. Thyroid can be worked up to two grains daily, and estrogens and androgens are given until the desired end point is obtained.[8] Desoxycorticosterone is usually not necessary. Surgery is employed when headache or visual loss is progressive. X-ray is recommended in the remaining cases of tumor.

SUMMARY

A plea is made for earlier recognition of panhypopituitarism. Three cases are presented, and the cardinal features of the disease and its treatment are discussed.

BIBLIOGRAPHY

1. Cluxton, H. E., Jr.; Bennett, W. A., and Kepler, E. J.: Anterior pituitary insufficiency, Ann. Int. Med., 29:733 (Oct.) 1948.
2. Brown, N. H., and Greenblatt, R. B.: Modification of response to prolonged ACTH therapy, J. Clin. Endo. 12:1040, 1952.
3. Soffer, L. J., and Gabrilive, J. L.: Primary and pituitary myxedema, Metabolism 1:236, 1952.
4. McKay, D. G., et al.: Panhypopituitarism: case report correlating clinical and pathologic findings, J. Clin. Endo. 10:540, 1950.
5. McCullagh, E. P., et al.: Alterations in testicular structure and function of organic disease of the pituitary, J. Clin. Endo. 10:871, 1950.
6. Perloff, W. H., et al.: The use of thyrotrophic hormone (TSH) in the diagnosis of myxedema, J. Clin. Endo. 11:1495, 1951.
7. Kenigsberg, S., and McGavack, T. H.: The excretion of 17-ketosteroid II. Values in several endocrine disturbances, J. Clin. Endo. 12:1551, 1952.
8. Albert, A., et al.: Male hypogonadism: V. The testis in adult patients with multiple defects of pituitary function, Proceedings of the Staff Meetings of the Mayo Clinic. 29:317, 1954.

Before World War I, a tailoring firm which claimed in the chaste pages of the *Saturday Evening Post* that it purveyed its talents and worsteds to the business and professional leaders of the land, had this as its slogan: "If you think clothes don't make any difference in a man, try walking down the street without any."

Just a touch of paraphrasing and we have: "If you think doctors don't make any difference in a community, try living in one without any."

Mr. Frederick W. Ware, Managing Editor
Omaha World Herald

Blood Volume in Traumatic and Hemorrhagic Shock

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INTRODUCTION

It was at the outbreak of World War I that investigators became interested in the dynamics of shock. It was then that the first accurate blood volume determinations were devised. The results of that period were summarized in the classic work of Cannon[5] in 1923. With World War II investigation in shock received further impetus, and a tremendous amount of work was done. Wiggers in 1942[53] attempted to organize this information. With the advent of isotopes, there has been renewed interest again.[11, 44, 47] Recently Frank[18] wrote an excellent monograph on the present status of the shock problem.

In the present attempt to correlate experimental and clinical findings concerning the relation of blood volume to the shock syndrome, it again becomes apparent that it is as true now as it was in 1942 when Wiggers stated, "A review of existing reviews does leave the impression, however, that if they have any short-comings, these are (a) that many writers have marshalled and oriented experimental discoveries so that they seem to support only one favored theory of shock; (b) that in the zeal to crystallize conceptions concerning the mechanism of shock, *conclusions* have been accepted too generously in place of *demonstrated facts;* and (c) that the experimental conditions under which incontrovertible results have been obtained were not always carefully scrutinized and evaluated."[53]

DEFINITION

At the outset we are unable to adequately define shock. There are many clinical variations of the syndrome, and it becomes difficult to know what anybody else means when they use the term. Findings in shock depend on etiological factors. In this discussion we will be concerned primarily with shock due to trauma and hemorrhage. This type of shock is recognized by hypotension, weak, thready pulse, drowsiness, pallor, perspiration, cold extremities, thirst, diminution in circulating blood volume. If it is not corrected, it leads to a state of irreversibility and death. Not all of these findings will be present in each case, but common to all is a decrease in blood volume.

Clinically shock also can be divided into (a) impending shock in which the pressure may not have fallen appreciably and in which only perspiration, drowsiness or excitement, and pallor are found; (b) decompensated phase which shows most of the findings including low blood pressure; and (c) irreversibility in which restoration of blood volume does not restore circulatory dynamics and death results.

The study of the shock problem is difficult from a clinical standpoint because the patient in shock is an emergency. To attempt experimental manipulations on the patient under these conditions is dangerous. It is not possible to control etiological and contributing factors in clinical cases, so comparison of cases is of limited value. Some of the studies in the armed services have taken advantage of the more or less uniform type of shock-producing trauma, but these studies are also full of variables. So we have to turn to the laboratory and thus to animal experimentation for some answers, attempting clinical correlation when possible.

MEASUREMENT OF BLOOD VOLUME

There are two general methods of blood volume determination. One method measures plasma volume, using dye or tagged plasma constituents. The other measures cell volume directly, utilizing the radioactive tagging of red cells. Total blood volume is then determined from the total plasma or cell volume and the hematocrit. The technique for the dye T-1824 or Evans' Blue has been very carefully worked out, and results by different investigators are comparable.[23] Storaasli[46] used radioactive iodinated plasma proteins and found on humans that values obtained were smaller than those obtained with T-1824. Aust and co-workers,[1] also using radioactive iodinated human serum albumin (RIHSA), confirmed these findings.

The other general method of blood volume determination involves cell-tagging methods. Fe_{55}, P_{32}, K_{42}, and Thorium B have been used, and the results are in general comparable.[2, 3, 21, 31, 32, 33, 36, 40, 43, 51] These methods give a direct reading of the red cell volume of the body. Using P_{32} Nachman[33] found the red cell volume 20 per cent less than the value obtained with T-1824. He felt this difference was due to the discrepancy between the venous hematocrit and the body hematocrit. In shock this discrepancy is 26 per cent.[21] Berson and Yalow,[2] in simultaneous determinations using P_{32} and RIHSA, found in every instance the whole blood volume evaluated by the tagged albumin dilution was greater than that derived from dilution of tagged cells. Hevesy[24] believes that K_{42} method is more accurate than P_{32}. In general it can be stated that the T-1824 method gives a fairly

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accurate determination of the plasma volume, although the RIHSA is probably more accurate, and P_{32} values for red cell volume are accurate. Total blood volume from the dye method gives values too high. The most accurate total blood volume determinations will be obtained by measurement of both plasma and red cell volume and adding the two.

McLain,[29] trying to correlate bleeding methods with dye methods, showed that bleeding gave the most consistent results. The dye studies exceeded bleeding by 67 per cent for rabbits and 44 per cent for dogs.

There are several factors which make comparison of clinical and experimental findings quite difficult and lead to considerable confusion. One factor is the peripheral hematocrit. The technique of hematocrit determination varies with the investigator and is usually not described in his monograph. There is a difference in whether venous, arterial, or capillary blood is used and whether it is taken with or without stasis. How accurately the peripheral hematocrit reflects the actual ratio of total red cell volume/total plasma volume in the body is not known, but available studies[3, 9, 33, 51] have shown the body hematocrits lower by values from 6 to 15 volume per cent. This discrepancy is believed due to plasma trapping in the centrifuged red cells in the tube and to the plasma lining of the minute vessels.

In any method of blood volume determination there must be complete mixing of the agent in the vascular space. If some portion of the vascular system is stagnant, the results will be inaccurate. However, since it is the physiological volume or the functional circulating volume that is significant in the hemodynamics, the anatomical vascular volume is of secondary importance. The determinations still have value.

Experiments[26, 28, 55, 56] have shown the effect of anesthetics on shock varies with the agent, but morphine and barbiturates are detrimental to circulatory function.

The accuracy of the peripheral red cell count as routinely performed by laboratories is doubtful. Using photoelectric methods the hemoglobin can be determined within 2 per cent. Other methods that have been used are the specific gravity of the blood and plasma and the total protein of the blood. Each of these has some value if properly interpreted. Taken alone they are not reliable as an index of the patient's circulatory condition.

As to normal values for total blood volume, total plasma volume, and total red cell volume, the best that can be done is to describe the range. The individual variation is wide. Chaudhuri and Chakravarti's[6] attempt to correlate blood volume and plasma volume with body weight and body surface in healthy Indians led them to believe that the correlation between blood volume and body surface is the better. They found an average plasma volume of 47.7 c.c./kg. or 1,591 c.c./sq. meter body surface. There was a wide individual variation in all factors. Other reports are comparable. Gregersen and Nickersen[23] tried to correlate blood volume to body types but could draw no definite conclusions. Evidence seems to indicate that failure to account for body types is responsible for the difficulty of obtaining normal values. Even if we know the blood volume of a patient in shock, we do not know its relation to his normal volume or how much he has lost. Also it has been shown that in different disease conditions there is a change in the blood volume, and the body functions on that volume until the disease state is corrected.

CIRCULATORY DYNAMICS OF SHOCK

The factors regulating blood volume are many and, for the most part, unknown. It must be remembered that the function of the circulatory system is to maintain the homeostasis or the constancy of the internal environment of body cells. Therefore, it is the blood flow to the tissues and cells which is the primary consideration, not the blood volume or the blood pressure. If the regulating mechanism could be discovered, the greatest barrier to correct therapy of shock would be removed. In hemorrhagic and traumatic shock there is a reduction in circulating blood volume. The body reacts to this blood loss by mechanisms of protection and replacement, mechanisms which operate simultaneously and not sequentially.

In hemorrhagic shock without tissue damage, there is an initial immediate decrease in total circulating blood volume. The loss is whole blood. Both clinically and experimentally it has been found that approximately 40 per cent of the total blood volume must be lost before signs of severe shock are seen.[14, 37, 47, 49] Mild shock is seen with around 25 per cent of total blood volume loss. In Emerson and Ebert's[14] study of battle casualties, an average loss of 40 per cent was associated with blood pressure less than 85 mm. Hg., while blood pressures over 100 had less than 25 per cent loss. These figures are comparable to most other studies.

Walsh and Sewell[50] studied the effects of simple blood loss in healthy males. When 500 cc. was taken from the antecubital vein, there were no symptoms at all. With repeated hematocrit, hemoglobin and red blood cell count determinations, they found the lowest values for all tests were seen on the 4th day in all cases. In most instances, recovery was still incomplete on the 24th day. Repeated 500 cc. bleedings three months later produced an immediate fall in hematocrit levels to a mean low at 6 hours. This indicates that hemodilution does not occur immediately but is

a gradual process, and that restoration of erythrocytes and hemoglobin is also a gradual process under these conditions.

Ebert, Stead and Gibson[10] in 1941 reported studies in which from 760 to 1,220 cc. of blood were removed from healthy subjects within a period of 6 to 13 minutes. Five of these subjects showed circulatory collapse with symptoms coming on near the end of bleeding. These symptoms were pallor, cool hands, and sweating forehead. Collapse was sudden with fall in blood pressure, pulse dropping to 36 to 40. Complaints were weakness, nausea, sensation of weight on epigastrium and blurred vision. There was ashen pallor, retching, perspiration, and a slow response to command.

They found a sharp drop in plasma volume with a gradual increase until the end of the 3rd or 4th day, when it was greater than the original plasma volume by an amount approximately equal to the volume of red blood cells removed. When no intravenous fluids were given, the plasma volume increased only 145 to 230 cc. in the first 111 minutes, even when 760 to 1,070 cc. of blood had been removed. During the first two hours, the increase in plasma volume was accompanied by a decrease in serum protein concentration and only slight increase in total protein. This indicates addition of a protein poor fluid. This was completed in less than two hours. Protein concentration then did not change, indicating both protein and fluid were being added as plasma volume increased.

In 3 cases, 1,000 cc. normal saline was added intravenously immediately. There was then a sharp drop in protein concentration and hematocrit, although not as much as calculated if all the saline had stayed in the vascular tree. Three hours after the saline was given, the hematocrit and protein concentration rose, indicating the fluid was leaving the blood stream. After this period, the protein concentration was constant while the hematocrit fell, indicating fluid and protein both being added.

The values for plasma volume in these cases 3½ hours and 5 hours after the saline were 270 cc. and 370 cc. lower than prehemorrhage levels. Qualitative protein changes were not found to occur. The hematocrit gradually fell, paralleling the rate of increase in plasma volume. When saline was given, there was an immediate drop with rise as the fluid left the blood stream, after which the usual gradual drop was seen. The determined and calculated red cell volume did not vary within the first 2 hours, but after that the actual red cell volume was lower than the predicted cell volume. Thus, it appeared to them that the total red cell volume cannot be accurately calculated from plasma volume and hematocrit because the cell/plasma ratio in large and small vessels is different. They felt the increase of plasma volume or passage of fluid into the vascular space is not a function of pressure but of the plasma proteins.

Large amounts of fluid are not added immediately after hemorrhage. There are no depots of fluid or cells in the human body. Normal blood proteins are added, and they must either be stored as prepared protein outside the vascular space or materials to replace the protein must be readily available. This replacement occurs in the fasting state but more rapidly when on meat diet. No demonstrable numbers of red cells were added during the first 3 days.

Contrasting this report is a study by Berson[3] that following simple phlebotomy there is a rapid hemodilution resulting in a total blood volume exceeding the original and occurring within 1½ hours. Most studies reported do show that some degree of hemodilution does occur following simple phlebotomy, but it is not of the magnitude that might be suspected.

In a study of shock in battle casualties where there was tissue trauma in addition to blood loss, Emerson and Ebert[14] reported cases of severe shock where average blood loss was between 63 per cent to 80 per cent (patients sustained by plasma). They found that decrease in blood volume was not accompanied by profound anemia, judged by peripheral hematocrit and hemoglobin determinations, in those patients who had not received plasma. Thus they deduced that spontaneous hemodilution, at least during the first few hours, plays a minor role in restoration of blood volume.

They could find no consistent correlation between the pulse, pallor, coldness, mental changes, or degree of hypoproteinemia, and the degree of shock. Almost all patients in severe shock had some degree of anemia. Also it was seen that retention of blood diluent solutions, even when injected rapidly in excess of 2,000 cc. is not of sufficient duration or magnitude to promote significant hemodilution in the recipient. Their average volume of blood and plasma replaced was 2,650 cc.

They found two criteria helpful in estimating the degree of blood volume deficit: (1) The character of the wound. Traumatic amputations, compound fractures of large bones, severance of major vessels, chest wounds with signs of hemothorax, and lacerations of abdominal viscera with hemoperitoneum are accompanied by large blood losses. (2) Systolic blood pressure except in injuries to the nervous system. They suggest that while plasma is a good emergency substitute, it must be used carefully because it produces anemia in oligemia. This anemia is difficult to correct after plasma injection without overloading the circulation. Do not use more than 1,000 cc., and use cautiously in chest injuries.

Elman and Risdel,[13] experimenting on dogs, believed that differences in hemodilution were due to variation in physical condition, nutrition, hydration,

and size of the dogs. Blood volumes and individual responses were variable. Their results indicate hemodilution usually occurs promptly, is of variable degree, and persists up to 24 hours in nonfatal cases. A supine immobile position retards hemodilution significantly. Rapid hemodilution usually is seen following immediate mobilization and free access to water.

Elman and others[12] found a definite hemodilution occurring uniformly and immediately in response to a single nonfatal hemorrhage. The most pronounced dilution occurred in the first hour but continued at a decreased rate for 72 hours.

With respect to the capacity of the body to hemodilute and its state of hydration, Ingraham and Wiggers[27] found that when intravenous saline of .5 per cent body weight was given prior to hemorrhage, the power to hemodilute was markedly improved as was the ability to withstand the shock ordinarily produced. Weston et al.[52] suggest that the conflicting reports of hemodilution and hemoconcentration may be related more to the state of hydration before hemorrhage than to anything else.

The failure of persons in severe shock to respond to complete replacement of the blood volume has led to the supposition that there is an increase in capillary permeability with loss of fluid into the tissues. Fine and Seligman,[15] using radioactive plasma protein, found that the dog in shock does not lose plasma into the tissues. Similar evidence showed the deficiencies in circulating plasma volume created by hemorrhage did not increase as shock progressed. The phenomena which are set in motion by the initial critical loss in circulating plasma volume and which lead to death do not require that a progressive decline in plasma volume take place. Plasma loss into tissue is, therefore, not a critical factor in hemorrhagic shock.

Pursuing this study further, Fine and Seligman[17] have also shown that in localized areas of injury there is loss of plasma into that area in considerable amounts.[30] The actual quantity lost, according to Nickerson,[35] in fatal untreated cases was 4.5 per cent of the total body weight, figures which are comparable to the total blood loss by hemorrhage in fatal cases.

Zweifach[57] conducted studies of the terminal vascular bed in tourniquet shock,[16] and he was able to clearly demonstrate sequestration of blood in the mesenteric capillaries and collecting venules. Shock is thus caused by both local fluid loss in the injured leg and by sequestration of blood. Taping the leg tightly to prevent accumulation of fluid did not, however, prevent shock from occurring if the tourniquet was left on long enough. This indicates rather definitely that there is more involved than just local fluid loss.

Whether or not there are compensatory reserves of blood in the body is a question. Attempts to mobilize reserves of red cells or of plasma by hemorrhage[49] or by epinephrine[9] have been unsuccessful. Pooling of blood in extremities did not cause mobilization. While reserves do exist in some animals, they do not exist in man. Delorme and co-workers,[17] using P_{32}, found evidence that led them to postulate that sequestered red cells are released from some blood depot. The closed sinusoidal system of the bone marrow is considered to be the most likely source of these cells. This is in keeping with the known stimulant effect of chronic anoxemia upon hematopoietic tissue.

It remains an unanswered question as to why, in view of the fact that loss of whole blood causes a pouring out of a protein-poor diluent at a variable rate into the blood stream, the direct addition of such a protein-poor fluid via needle does not restore the blood volume for any appreciable length of time. In some studies done by Hubay and others[25] regarding blood volume changes with parenteral administration of modified human globin solution, it was found that after infusion of 500 ml. of globin solution the plasma volume showed an average increase of 278 ml. Following plasma infusion the average increase was 540 ml. Studies on other blood and plasma substitutes are similar.

Another factor which is difficult to evaluate is the condition of the patient in shock contrasted with his state of health prior to onset of shock. Attempts to evaluate this factor by Nelson and Lindem[34] in 1950 led them to state that the development of a state of chronic shock in a traumatized previously healthy patient depends upon a number of factors including inactivity, unreplaced blood loss, inadequate protein and caloric intake, infection, and exudative protein loss.

Bed rest alone results in a depletion of the blood volume affecting both fluid and cellular portions and averaging 500 ml. in a three-weeks period.[48] Depletion of hemoglobin results in the preferential use of protein for the manufacture of hemoglobin, and thus protein depletion and weight loss. Whole blood can supply only a small part of this protein need. Correction of red cell deficits can establish a positive nitrogen balance and makes administered protein available for other needs, wound healing, and gain of weight. The individual who has lost weight from a variety of diseased states is easily precipitated into shock from minor blood loss. He shows definite diminution in blood volume, total red cell volume, and plasma volume. Hemoglobin concentration is an inadequate guide to the hemoglobin deficit in these cases.

Gibson, Seligman, and others[21] have shown that all erythrocytes are in active circulation at all times in the normal state. They feel 17 per cent of the total blood volume is contained within the capillaries.

Pronounced gradients in the hematocrit of whole blood as it flows from larger to smaller vessels is found. They have demonstrated that there is always a greater reduction in circulating red cells and plasma than can be accounted for by measured external loss. Part may be due to loss into injured areas or intestinal bleeding. There is widespread trapping of red cells within the minute vessels, causing an abnormal distribution of whole blood between large and minute vessels which is not reflected in arterial hematocrit. This degree of red cell trapping is related to the mean arterial pressure.

Out of the work of Shorr, Zweifach, and associates has come a great mass of experimental information on the peripheral circulation in shock. They briefly describe the peripheral circulation response to hemorrhagic shock in three stages: (1) hyperreactive compensatory, (2) hyporeactive decompensatory, and (3) intermediate where each is equally prominent.[57] Acute hemorrhage accentuates certain normal features of the capillary circulation in the compensatory reaction against fluid loss. The main feature is an augmentation of the vasomotion which contributes to hemodilution.[58] In the hyporeactive stage there was capillary filling, decrease in return, and stagnation in the venules, along with arteriolar loss of constriction and opening of the precapillary sphincters.

The phenomenon of vasoconstriction accompanying traumatic shock is also in dispute. Vasoconstriction is due to sympathetic reflex discharges initiated by receptors in the aortic arch and also by other factors. This type of vasoconstriction favors the organism only when blood flow to muscles is important. Hence the deprivation of blood from the liver, kidneys, and other viscera is actually detrimental to the body. Experiments with vasoconstrictor and sympatholytic drugs have shown interesting but not conclusive results.[41, 44, 54]

Shorr makes the point that the vasoconstriction of the larger vessels is mediated by way of the adaptive reflexes which originate in receptors and appear to bear no direct relationship to the blood flow in the terminal vascular bed. The control of the terminal vascular bed is thought by him to be due to humoral factors.

Just how much of the circulatory failure of shock is due to actual loss of blood volume and how much to stagnation is not answered by present experiments. It is known that in late stages of shock and in true irreversible shock there is pooling and stagnation of blood in the gut and the portal circulation. Frank[19, 20, 44, 47] has shown that there is a severe hepatic venous vasoconstriction in shock which will cause portal pooling. However, this is not the reason for irreversibility in shock, because Eck fistula dogs still develop irreversibility in shock and do not have the portal pooling.

Another circulatory factor of interest has been pointed out by Goldberg and Fine,[22] that in hemorrhagic shock in dogs the absorption of glucose and water from the intestinal tract is considerably impaired. Contrastingly, saline is absorbed in shock as well or perhaps somewhat more readily than under normal conditions.

COMMENT

From these studies we can state rather definitely that blood volume studies do have an important place in the diagnosis and management of shock.[8] The methods are reliable but still too cumbersome to be universally accepted.[38] However, in the final analysis the most reliable guide is good clinical judgment.

The value of the usual laboratory determinations of red cell count, hematocrit, and hemoglobin concentration all too frequently fail to reflect the level of total circulating hemoglobin or blood volume.[4, 21, 38, 39, 42, 44, 45, 47] There can occur a marked decrease in both plasma and blood volume with almost normal hemoglobin concentrations. Snyder[45] concludes in his study of shock that, "There are no useful laboratory guides in the treatment of shock. The clinical judgment of the attending physician must determine the management."

Warren Cole[45] also states, "Hematocrit and hemoglobin determinations are worthless in the diagnosis of hemorrhage of only 3 or 4 hours duration. Blood volume studies are much more accurate but still so inaccurate that I am hereby making a plea for research workers to attempt perfection of better methods."

Indirect plasma and cell measurements are inaccurate since large vessel blood concentrations do not accurately reflect total body values. Direct determinations are necessary. Blood volume regulation is a dynamic equilibrium in which the blood pressure, differential osmotic pressure of plasma and tissue fluid proteins, fluid and electrolyte balances, and hematopoietic activity are all factors, but the controlling mechanism is unknown. The various components of the blood can and do act independently.

We are still describing various mechanical characteristics of shock and not basic pathology. For while the associated phenomena in different types of shock modify the pattern of events impressively, beneath them a mechanism exists, which in itself has fatal potentialities and which can produce all the basic phenomena common to all types of shock, namely, peripheral stagnation, lowered systolic and diastolic pressure, lowered venous oxygen saturation, lowered venous pressure, decreased venous return, decreased cardiac output, increased acid metabolites, and death.[15]

SUMMARY

In conclusion, the response of the body to traumatic and hemorrhagic shock with loss of whole

blood is one of immediate vasoconstriction and delayed restoration of blood volume. Factors which govern restoration of blood volume are complex and variable. It is generally accepted that some hemodilution with protein-poor fluid occurs soon, but the amount poured into the vascular spaces depends upon individual conditions. The most useful guide to the evaluation and management is clinical judgment. Laboratory studies are not reliable. Blood volume studies do contribute to the over-all evaluation of the case.

BIBLIOGRAPHY

1. Aust, J. B.; Chou, S. N.; Marvin, J. F.; Brackney, E. L., and Moore, G. E.: The use of radioactive iodinated human serum albumin (RIHSA) for clinical total blood volume studies, Surgical Forum, Saunders, p. 601, 1951.

2. Berson, S. A., and Yalow, R. S.: The use of K_{42} or P_{32} labelled erythrocytes and I_{131} tagged human serum albumin in simultaneous blood volume determinations, J. Clin. Investigation 31:572 (June) 1952.

3. Berson, S. A.; Yalow, R. S.; Azulag, A.; Schreiber, S., and Roswit, B.: The biological decay curve of P_{32} tagged erythrocytes. Application to study of acute changes in blood volume, J. Clin. Investigation 31:581 (June) 1952.

4. Burbank, B.: Therapy of traumatic shock, Ann. Int. Med. 35:857, 1951.

5. Cannon, Walter B.: Traumatic Shock. D. Appleton & Co., New York, 1923.

6. Chaudhuri, R. N.; Chakravarti, H., and Dutta, B. N.: Blood volume in healthy Indians, Indian J. M. Res. 39:237, 1951.

7. Delorme, E. J.; Mukherjee, S. R., and Rowlands, S.: Studies of the circulation in hemorrhagic shock by means of erythrocytes labelled with radio-phosphorus, Quart. J. Exper. Physiol. 37:2, 1952.

8. Dodds, Max E., and Curry, George J.: Blood and plasma volume studies in the severely injured, Am. J. Surg. 80:6, 1950.

9. Ebert, R. V., and Stead, E. A.: Demonstration that in normal man no reserves of blood are mobilized by exercise, epinephrine, and hemorrhage, Am. J. M. Sc. 201:655, 1941.

10. Ebert, R. V.; Stead, E. A., and Gibson, J. G.: Response of normal subjects to acute blood loss with special reference to the mechanism of restoration of blood volume, Arch. Int. Med. 68:578, 1941.

11. Eiseman, Ben: A review of some recent advances in the study of shock, Surgery 33:149 (Jan.) 1953.

12. Elman, Robert; Lischer, C. E., and Davey, Harriet Wolf: Plasma proteins (albumin and globulin) and red cell volume following a single severe non-fatal hemorrhage, Am. J. Physiol. 138:569, 1943.

13. Elman, Robert, and Risdel, Harry: Hemodilution following experimental hemorrhage, Arch. Surg. 53:635, 1946.

14. Emerson, C. P., and Ebert, R. V.: A study of shock in battle casualties, Ann. Surg. 122:745.

15. Fine, J., and Seligman, A. M.: Traumatic shock. IV. A study of the problem of the "Lost Plasma" in hemorrhagic shock by the use of radioactive plasma protein, J. Clin. Investigation 22:285, 1943.

16. Fine, J.; Frank, H. A., and Seligman, A. M.: Traumatic shock. VIII. Studies in the therapy and hemodynamics of tourniquet shock, J. Clin. Investigation 23:731, 1944.

17. Fine, J., and Seligman, A. M.: Traumatic shock. VII. A study of the problem of the "Lost Plasma" in hemorrhagic, tourniquet, and burn shock by the use of Radio-active Iodoplasma protein, J. Clin. Investigation 23:720, 1944.

18. Frank, Howard: Present-Day Concepts of Shock, New England J. Med. 249:445, 1953.

19. Frank, H. A., and others: Traumatic shock. XXII. Irreversibility of hemorrhagic shock and VDM hypothesis. Failure of ferritin to affect arterial pressure and survival period of hepatectomized-nephrectomized dogs, Am. J. Physiol. 168:1 (Jan.) 1952.

20. Friedman, E. W.; Frank, H. A., and Fine, J.: Portal circulation in experimental hemorrhagic shock, Ann. Surg. 134:70, 1951.

21. Gibson, John G.; Seligman, A. M.; Peacock, W. C.; Fine, Jacob; Aub, Joseph C., and Evans, P. D.: The circulating red cell and plasma volume and the distribution of blood in large and minute vessels in experimental shock in dogs. Measured by radioactive isotopes of iron and iodine, J. Clin. Investigation 36:126, 1947.

22. Goldberg, M., and Fine, J.: Traumatic shock. XI. Intestinal absorption in hemorrhagic shock, J. Clin. Investigation 24:445, 1945.

23. Gregersen, M. I., and Nickerson, J. L.: Relation of blood volume and cardiac output to body type, J. Appl. Physiol. 3:329, 1950.

24. Hevesy, G., and Nylin, G.: Application of K_{42} labelled red corpuscles in blood volume measurements, Acta Physiol. Scandinav. 24:285 (Feb.) 1952.

25. Hubay, C. A.; Abbott, William E.; Abelson, A.; Cebul, F., and Izant, Robert J.: Blood volume changes with parenteral administration of odified human globin solution, Surgical Forum, Saunders, p. 642, 1951.

26. Ingraham, R. C.; Goldberg, H.; Rownchild, F., and Wiggers, H. C.: Influence of sodium pentobarbital upon course of events in experimental hemorrhagic shock, Am. J. Physiol. 162:243, 1950.

27. Ingraham, R. C., and Wiggers, H. C.: Alkalinizing agents and fluid priming in hemorrhagic shock, Am. J. Physiol. 144:505, 1945.

28. Lee, R. E., and Zweifach, B. W.: Vasodepressor responses to morphine following hemorrhagic hypotension, Am. J. Physiol. 157:259, 1949.

29. McLain, P. L.; Ruhe, C. H. William, and Kruse, T. K.: Concurrent estimates of blood volume in animals by bleeding and dye methods, Am. J. Physiol. 164:611, 1951.

30. Moore, D. H.; Nickerson, J. L.; Powell, A. E., and Marks, Grace: A study of the transfer of serum proteins into tissue injured by tourniquet, Proc. Soc. Exper. Biol. & Med. 77:706, 1951.

31. Mukherjee, S. R.; Ritchie, H. D., and Rowlands, S.: A quick method of measuring blood volume with P_{32} labelled erythrocytes, Brit. J. Plas. Surg. 5:146, 1952.

32. Mukherjee, S. R., and Rowlands, S.: A direct method of measuring circulating blood volume, Lancet 2:98, 1951.

33. Nachman, H. M.; James, G. W. III; Moore, J. W., and Evans, E. I.: A comparative study of red cell volumes in human subjects with radioactive phosphorus tagged red cells and T-1824 dye, J. Clin. Investigation 29:258, 1950.

34. Nelson, Woodrow, and Lindem, W. C.: Studies on blood volume in patients depleted as a result of trauma, Am. J. Surg. 80:16, 1950.

35. Nickerson, John L.: Local fluid loss in trauma, Am. J. Physiol. 144:429, 1945.

36. Nickerson, J. L.: Gregerson, M. E.; Root, W. S., and Sharpe, L. M.: Influence of blood incompatibilities on measurement of blood volume by ceil-tagging methods, Proc. Soc. Exper. Biol. & Med. 75:61, 1950.

37. Noble, R. P., and Gregersen, M. I.: Blood volume in clinical shock. II. The extent and cause of blood volume reduction in traumatic, hemorrhagic, and burn shock, J. Clin. Investigation 25:172, 1946.

38. Parsons, W. H.; Williams, William T., and Forsythe, L. J.: The clinical significance of blood volume determinations, Ann. Surg. 135:6, 1952, p. 791.

39. Price, Philip B.: Blood volume in health and disease, J. A. M. A. 145:781, 1951.

40. Reeve, E. B.: Use of radioactive phosphorus for the measurement of red cell and blood volume, Brit. M. Bull. 8:181, 1952.

41. Remington, J. W.; Hamilton, W. F.; Boyd, G. H.; Hamilton, W. F. Jr., and Goddell, H. M.: Role of vasoconstriction in the response of the dog to hemorrhage, Am. J. Physiol. 161:116, 1950.

42. Rudman, I., and Stewart, John D.: Quantitative aspects of hemorrhage, Surgery 28:170.

43. Salzberg, A. M., and Evans, E. I.: Blood volume in normal and burned dogs: A comparative study with radioactive P tagged red cells and T-1824 dye, Ann. Surg. 132:746, 1950.

44. Shock and Circulatory Homeostasis. Transactions of the First Conference, 1951. Harold Green, Editor, Josiah Macy Jr. Foundation.

45. Snyder, Howard E.: Early recognition and management of shock, Am. J. Surg. 83:3, 382, 1952.

46. Storaasli, J. P.; Kruger, H.; Friedell, H. L., and Holden, W. D.: Use of radioactive iodinated plasma protein in the study of blood volume, Surg. Gynec. & Obst. 91:458, 1950.

47. Symposium on Shock. Army Medical Service Graduate School, Washington, D. C., May, 1951.

48. Taylor, H. L.; Erickson, L.; Henchel, A., and Keys, A.: Effect of bed rest on the blood volume of normal young men, Am. J. Physiol. 144:227, 1945.

49. Walcott, W. W.: Blood volume in experimental hemorrhagic shock, Am. J. Physiol. 143:247, 1945.

50. Walsh, R. S., and Sewell, A. K.: Some effects of blood loss in healthy males, M. J. Australia 1:73, 1946.

51. Wasserman, L. R.; Yoh, Tse-fei, and Rashkoff, Ira A.: Blood volume determination: comparison of T-1824 and P_{32} labelled red cell methods, J. Lab. & Clin. Med. 37:342, 1951.

52. Weston, R. E.; Janota, Martha; Levinson, S. O., and Necheles, H.: Studies on hemoconcentration and shock following severe hemorrhage, Am. J. Physiol. 138:450, 1943.

53. Wiggers, Carl J.: The present status of the shock problem, Physiol. Rev. 22:74, 1942.

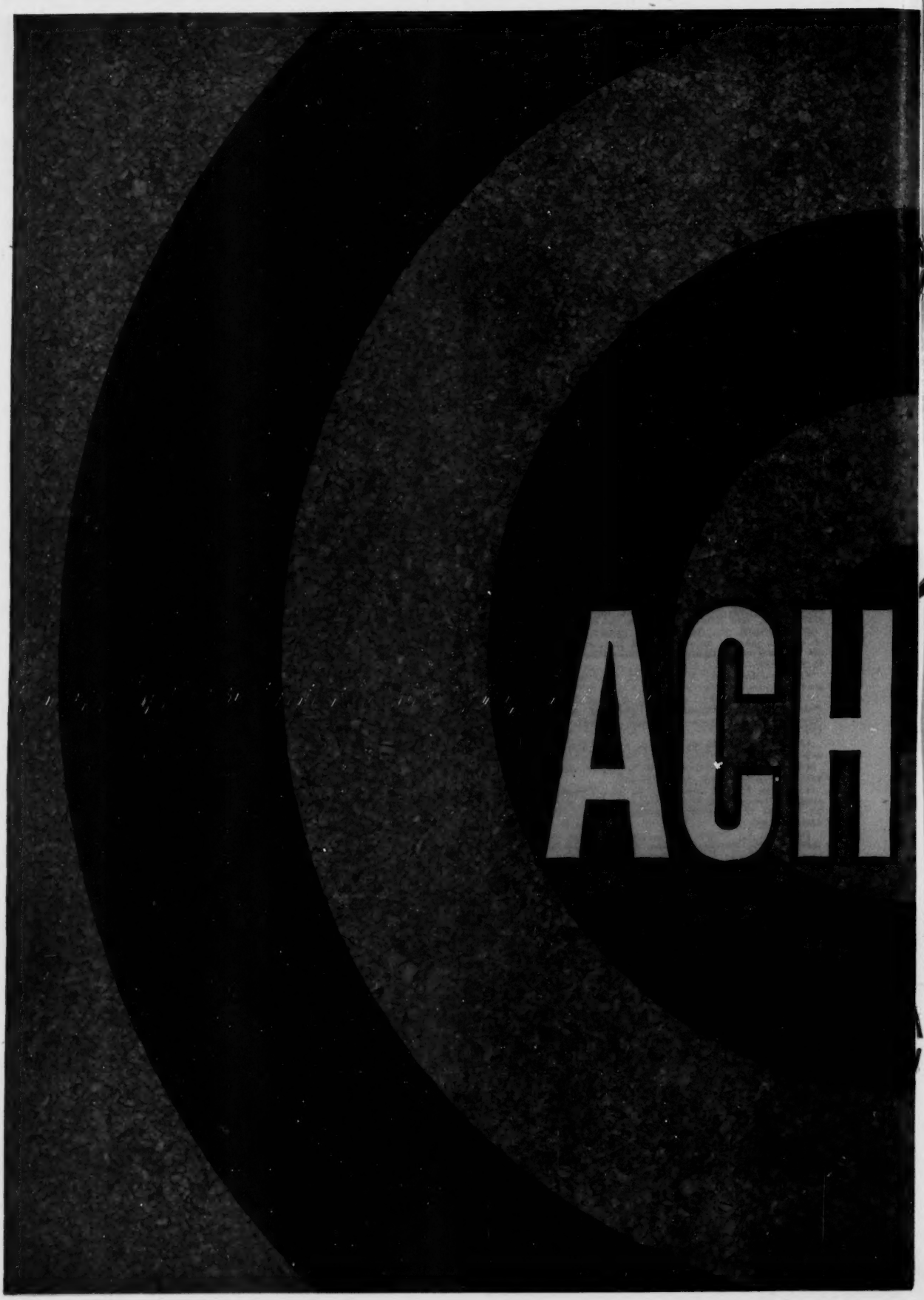
54. Wiggers, H. C.; Goldberg, H.; Roemlutel, F., and Ingraham, R. C.: Impending hemorrhagic shock and the course of events following administration of Dibenamine, Circulation 2:179, 1950.

55. Zweifach, B. W., and Hershey, S. G.: Predisposing action of anesthetic agents on vascular responses in hemorrhagic shock, Surg. Gynec. & Obst. 89:469, 1949.

56. Zweifach, B. W.; Hershey, S. G.; Rovenstine, E. A.; Lee, R. E., and Chambers, R.: Anesthetic agents as factors in circulatory reactions induced by hemorrhage, Surgery 18:48, 1945.

57. Zweifach, B. W.; Abell, R. G.; Chambers, R., and Clowes, G. H. A.: Role of the decompensatory reactions of peripheral blood vessels in tourniquet shock, Surg. Gynec. & Obst. 80:593, 1945.

58. Zweifach, B. W.; Lowenstein, B. E., and Chambers, R.: Responses of blood capillaries to acute hemorrhage in the rat, Am. J. Physiol. 142:80, 1944.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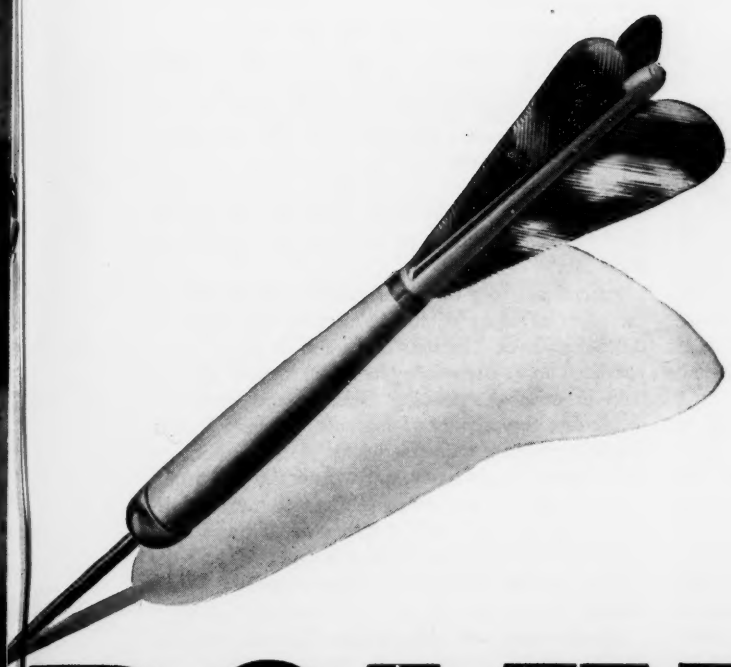

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THE MONTH IN WASHINGTON

Editor's Note. The following summary of Washington news was prepared by the Washington office of the A.M.A. for distribution to state and regional medical journals.

With the 84th Congress well into its first session, all indications point to an active year in medical legislation. Many of the bills will founder somewhere along the way, but as of now an imposing number are lined up awaiting consideration in Senate and House.

Confirmation that medical problems rank high in the administration's work schedule for Congress came early in January in President Eisenhower's State of the Union Message. This is the address, delivered in person before a joint meeting of Senate and House, in which the President annually outlines in general terms the condition of the country and the new legislation he believes should be enacted.

This message highlighted the President's objectives, but did not tell in specific terms how he expected to reach them. The details came later, in five additional messages to Congress, including one on health on January 24. The President wants Congress to take action on the following health and medical items:

1. A federal health reinsurance service. This idea was rejected by the House last year, but neither Mrs. Hobby nor Mr. Eisenhower has given up hope for it.

2. A plan to insure better and more uniform medical care for public assistance recipients through larger U. S. appropriations and more administrative controls.

3. Federal assistance in construction of health facilities and in providing more trained health personnel (other than physicians).

4. A new federal program to combat mental illness and return more mental patients to useful lives outside institutions.

5. An improved federal program for aiding crippled children and for maternal and child health.

6. Strengthening of the pure food and drug laws to give greater consumer protection.

7. More attention to "the increasingly serious pollution of our rivers and streams and the growing problem of air pollution."

8. An expanded program for the medical care of military dependents.

9. A voluntary health insurance program for federal civilian employees with U. S. contributions and payroll deductions authorized for the employees.

So much for what the Republican President hopes to get through Congress. It is too early to say how much of this program will have the support of the Congress, now under Democratic control. It is clear, however, that many leading Democrats want to enact some legislation the President didn't include in his program. In the early weeks of the session they introduced scores of bills to carry out their ideas.

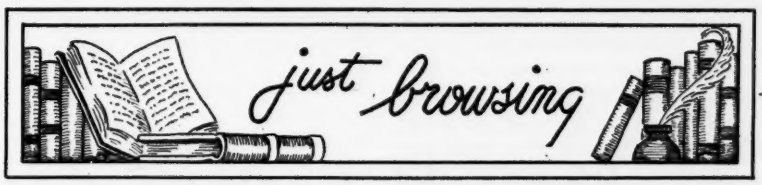
Federal aid to medical education is prominent in the plans of many of the Democrats, and some of the Republicans. The bills cover a wide range, some restricted to construction grants but others offering help in meeting operating expenses and incentives to increase the number of students. Other bills offer federal grants to voluntary health plans to subsidize coverage of the indigent, the "medically indigent," the unemployed, and the aged. Because the administration has declared itself opposed to subsidies, it is unlikely that any measures of this type will win the support of Mrs. Hobby's department and the White House.

Members on both sides of the aisle also are proposing greater emphasis on research seeking the causes and cures of such diseases as cancer, heart disease, mental illness, and arthritis. Some of these bills fit in with the Eisenhower program and philosophy and are likely to have White House support at the hearings.

This tendency to stimulate more basic medical research, both at the federal level and through state grants, may be an important factor when Congress gets around to passing the appropriation bills for the various Institutes of Health, the research arm of U. S. Public Health Service.

Several years ago a Democratic Congress took a serious interest in a bill for federal aid to local public health departments. Some of the influential Democrats have revived this idea and are working for its passage this session. As expected, the old Truman-Ewing plan for national compulsory health insurance again is before Congress. The first one to introduce a bill along these lines was Rep. John D. Dingell, a sponsor of the original plan. Later others joined with him in backing the idea, but up to now the open support for it is not extensive on Capitol Hill.

Tabulations from the National Association of Blue Shield Plans show that a total of $273,723,925 was paid to physicians by the plans during the 12 months ending June 30, 1954.



In the January issue of the JOURNAL this page was inaugurated. As the title suggests, it is not intended that it should be committed to any specific topic, and, rather than being formal or scientific, it may concern almost anything which proved to be of interest to the writer. It is hoped that it may also be of interest to you as readers. Suggestions, criticisms, or other comments will be welcomed.

The design at the head of the page was drawn by William M. Mills, Jr., a practicing attorney in Topeka and the son of Dr. W. M. Mills, a former editor of the JOURNAL and a past president of The Kansas Medical Society. Though art work is entirely a side line with him, and one which regrettably has not been often pursued recently, he has again demonstrated his artistic and creative ability. I am greatly indebted to "Bill" for his kindness in designing this appropriate heading for the page, and hope the reading material may be of comparable quality.

Do you suppose the notes you made in medical school classes will be read (or worth reading) 75 years later? I am sure that mine, if they were still in existence, would fail to excite interest even at this date, let alone in another 50 years.

Not so with some lecture notes made by Dr. C. A. McGuire, formerly one of the recognized medical leaders in Topeka. These notes, written during the "Winter Session of 1882-1883," while he was a student at "Rush," are interesting in that they demonstrate careful physical examination and an understanding of physiology and pathology which shines through the strange and now obsolete methods of treatment. For example, on the subject of "Fracture of the Femur, Neck," we find:

"Usually in old people, rarely in young. Also more frequent in women and usually occurs as the result of slight violence. . . . *Entirely Within Capsule.* Is entirely cut off from nourishment except what it gets from ligamentum teres, so union is almost if not entirely impossible. Get an increase of synovial fluid so both ends are bathed in it and no chance for a provisional callus and it is very hard to immobilize the joint. . . .

"Treatment: Within Capsule Don't expect union. Put him to bed in a comfortable position and a quilt under his knee so legs will be adjusted easy, so leg will be drawn out to about normal length. . . . Let him remain a week or so until inflammation has subsided then begin to prop him up. Let him sit up and leg hang out on a stool, then into an easy chair, and so on to crutches and begin to bear weight on it gradually and in year or so may walk with crutch and cane.

Partly without: may hope for union unless (the patient) is too old or feeble. Put to bed on inclined plane and use adhesive strap and pulleys and weight. . . .

Entirely without: through the trochanters obliquely. Usually considerable shortening. Use extension and pelvic bandages."

(How do you suppose a current description of hip-nailing will sound in 2025? Do we have reason to think that our present methods will last longer than some of the earlier ones?)

"Fractures of the Patella: . . . in transverse we get considerable displacement. May be a compound one and open the joint and are Hell to treat. . . . upper fragment is drawn up. Rarely get a bony union. . . ."

Remembering that Lister's paper on antiseptic surgery had been written only 15 years before this, obviously open reductions were not safe enough to even be considered.

"Fractures of the Foot: Dress them about the same as fractures of the hand. Adjust as well as you can and pad well. Use your brains."

This last sentence sounds like a wonderful thing to do—often!—*O.R.C.*

PRESIDENT'S PAGE

Dear Doctor:

I quote with both pride and satisfaction a resolution passed at the last meeting of your Council and House of Delegates. It is as follows:

> "The Kansas Medical Society continues its position to favor a single high standard governing the practice of medicine and surgery.
>
> "Therefore, this Society will support and favor any measure that improves the standard of medical practice in the State of Kansas.
>
> "This Society further goes on record to affirm its conviction that the approved standard of medical education is the minimum under which the practice of medicine and surgery may be performed with safety to the public.
>
> "The Kansas Medical Society will welcome from any theory of healing, the invitation to have its schools approved by the Council on Medical Education and Hospitals of the American Medical Association as fully accredited schools of medicine, which, when accomplished, will entitle its graduates to be examined as are doctors of medicine in preparation for receiving a license to practice medicine and surgery in this state."

This resolution, of course, carries with it your pledge to work with and to advise your senators and representatives in all legislation affecting the health and medical care of our commonwealth. The groundwork you have done is already evident in the thinking of the legislature, even though just beginning. Please continue your good work as it is greatly appreciated.

Yours very truly,

Murray C. Eddy, M.D.

EDITORIAL COMMENT

Exchange of Information

Kansas physicians, like those in other states, have been known to complain that they don't have time for the reading they'd like to do, that they can't assimilate all the good material that's available. Perhaps to them the scientific papers published in the JOURNAL are less valuable than they are to other readers. We refer to physicians in foreign countries who receive the JOURNAL under an exchange agreement and who do not have access to a volume of medical literature.

Since the first issue was printed by The Kansas Medical Society, the JOURNAL has been sent to other scientific publications with the understanding that they would reciprocate. Consequently, our exchange list now includes all the journals of other state medical societies, many specialty publications, and journals pertaining to various scientific subjects. All copies received by the JOURNAL are forwarded to the library at the University of Kansas Medical center and are there made available to physicians and medical students.

At the end of World War II, a deluge of requests for exchange reached the JOURNAL from publications in foreign countries. Since financial considerations limit the number of exchanges the JOURNAL can maintain, all requests were carefully evaluated by members of the Editorial Board. At present the JOURNAL is being sent to all continents and to a great many countries. The foreign need for American medical literature is apparent in the following quotations from letters in the exchange file.

From Adelaide, South Australia—"We should like to be able to make your journal available in the university medical library, which is the only medical library in South Australia, and we hope that it will be possible for you to accept the exchange."

From the Philippines—"It is with profound regret that we inform you that our library had been completely burned by the ruthless enemy. . . . Principal medical institutions (it is painful to state) had been so utterly destroyed, that unless America and the other United Nations extend to us their helping hands we would not be able to rebuild them. . . . We suspended publication of our journal so the enemy would not be able to use it for propaganda. . . . We beg you to place us again on your mailing list. . . . We had been completely isolated from scientific world during 1942-1944, and you can understand how thirsty we are for new medical knowledge."

(Editor's Note—The Journal of the Philippine Medical Association was, of course, placed on the mailing list immediately after receipt of the above letter. The back copies requested were sent in packages of a size complying with postal regulations and mailed at the rate of one package per week, also in accordance with postal regulations, until the gaps in the Philippine files were filled.)

From Argentina—"We are very interested to establish exchange with your publication. We edit 4 annuals numbers, with Argentine original articles and medical world abstracts. Our reprint: 15,000 issues. Our readers: all Argentine, Paraguayan and Bolivian physicians."

From Italy—"We address to you our proposal to fix up a regular exchange. . . . If you would like it, the exchange could comprehend the numbers of some previous volumes."

From Victoria, Australia—"Since the war Australian doctors have become more interested than before in American medicine, probably because they met U.S.A. doctors at the front. We therefore hope that you will extend to us the courtesy for which we ask."

From Finland — "Societas Medicorum Fennica Duodecim herewith suggests an exchange of your publications against some of the *Annales and Medicina Fennica.* In case you feel inclined to send us in exchange for our periodicals from previous years corresponding volumes of your own old journals we ask you to kindly make us a proposal to this end."

From Germany—"As we hope that international relations in scientific life will certainly become normalized at an earlier date as those in other fields of human activity, and as we suffered in this country from a long time of seclusion from the scientific life of the outer world, we are especially keen to receive reports on advances in medicine abroad."

From Japan—"Tokushima City, where our school is situated, is on the island of Shikoku, separated from the Japanese mainland, so that, because of communication difficulties, it is not easy to borrow foreign magazines. . . . Any interchange of technical or other relevant information would also be very welcome to enlighten and encourage those of us who are devoting ourselves to medical science."

From India—"As good medical literatures are very few in this part of the world, a small library is started recently attached to the above hospital (St. George's Mission Hospital, Punalur, P.O., Travancore, South India) . . . so that up-to-date knowledge in Medical Practice may be obtained. Further Ayurvedic and Unani systems of Medicine are very troublesome competitors to Allopathic system here and proper equipments and medical literatures are highly essential. . . . I request you to kindly issue a news note requesting the sympathetic members of your Society to send me their used medical journals, with all available backward copies, medical books,

reprints of articles and other useful medical literatures and also second-hand surgical instruments, medical appliances, laboratory equipments, etc. This Act of Kindness and Charity by the members of your Society will ever be remembered which lapse of time cannot wipe away from our memory."

Should we complain that we have too much to read?

Federal Aid in Kansas

PART V

Federal aid to public health in Kansas is the fifth of this current series discussing the various programs in this state that are aided through the use of federal funds. All programs listed here are directed by the Kansas State Board of Health which collectively received $2,280,000 in federal funds in 1953. This represents just under one per cent of the total spent by the United States for these programs.

HOSPITAL SURVEY AND CONSTRUCTION

Federal grants for hospital survey and construction were first made available in 1946 and were first used in Kansas in 1949. Appropriations are made to the state, to localities, and to non-profit agencies to assist in determining the need for, and in the financing of, hospital construction. All applications for such aid from Kansas require the approval of the Kansas Advisory Hospital Council.

The administration agency at the federal level is the Department of Health, Education and Welfare. In 1953 the Kansas State Board of Health received $1,744,330 in federal funds, used in accordance with a formula based on population and relative per capita income of the state. Local participation, not less than one-third of expenditures within the state, accounted for approximately 60 per cent of construction costs.

GENERAL HEALTH ASSISTANCE

Although a federal program of general health assistance became operative with passage of the Social Security Act of 1935, Kansas did not participate until 1943. The general objective is to support local health services and provide, at the state level, laboratory services, vital statistics, and other generalized benefits. The Public Health Service of the Department of Health, Education and Welfare administers the program nationally.

The total federal expenditure in Kansas for this purpose in 1953 was $178,997, and the state contributed $639,116, making a total of $818,113. Although local expenditures for the year are not exact, a figure just under one million dollars approximates the amount received from local units.

MATERNAL AND CHILD HEALTH

A program designed to be of special assistance to rural areas and to those suffering economic distress provides maternal and child health services. It promotes maternal and child health through public and professional education, standard-setting, well-child clinics, day nurseries, and co-ordination of medical services and provides professional consultation services.

In 1953 Kansas received $147,127 from the Department of Health, Education and Welfare for this program. The state itself advanced $6,401 for a total of $153,528. There was no local participation. Apportionment of federal funds among states follows a formula allowing $60,000 per year per state, plus an amount on the basis of live births in the state, matched dollar for dollar, plus an amount based on relative state financial need for which no matching is required.

The federal program began in 1935, under provisions of the Federal Social Security Act of 1935, and Kansas has been participating since 1937.

CONTROL OF TUBERCULOSIS

The federal government entered the field of tuberculosis control in 1944, after passage of the Public Health Service Act, and Kansas participation in the program started the same year. The objectives are to assist in the detection, diagnosis, and control of tuberculosis. The Department of Health, Education and Welfare is the federal administrative agency.

The extent of the tuberculosis problem in a state accounts for 80 per cent of the federal apportionment. Other factors considered are population and relative state financial need. Matching is on a 50-50 basis, with state funds spent for tuberculosis sanatoria included. There is no financial participation on a local basis.

To qualify for receipt of federal funds in this category, each state must submit its program for the approval of the Public Health Service, stating the plan for operation of the program, the type of services to be rendered, and the amount of state funds available. Participating states must also have a merit system for employees and must agree to carrry out their programs as described to the Public Health Service.

The federal grant to Kansas for 1953 under this program was $61,987. Kansas spent $19,200 in addition to an appropriation to the State Sanatorium at Norton in the amount of $845,000.

CANCER CONTROL

The present plan for cancer control, inaugurated nationally in 1946, is administered by the Public Health Service. Kansas has been participating since 1948. The allocation of federal funds is based on population and financial need, with one dollar of state funds required for each two dollars from the federal source.

The total spent for cancer control by governmental agencies in 1953 was $74,532, of which $50,372 was from federal sources and $24,160 from state appropriations.

MENTAL HEALTH PROGRAM

The Public Health Service Act of 1944 and the National Mental Health Act of 1946 authorize the expenditure of federal funds, through the Public Health Service, to states for public and professional education, information interchange, and assistance in formation of community guidance clinics. Allocations are made only to states having an approved plan for mental health activities.

Based on population, the extent of mental health problems, and financial need, national funds are advanced at the rate of two dollars for each dollar of state or local funds. In 1953 Kansas received $43,516 for this purpose and added $33,604 of its own funds, for a total of $77,120.

VENEREAL DISEASE CONTROL

Federal funds for the control of venereal disease, determined on the basis of population (20 per cent), extent of the problem (60 per cent), and financial need of the state (20 per cent), are administered by the Public Health Service. The state agency uses the funds for reporting cases of venereal disease, investigating contacts and suspects, supervising clinics, purchasing drugs, and educational work. The federal government contributed $33,071 for this purpose in 1953, the state added $14,500, and local units gave $2,035.

HEART DISEASE CONTROL

With the general objective of assisting in the detection, diagnosis, and control of heart disease, the Public Health Service administers a program on the national basis. The plan has been operative since 1950. Each two dollars of federal funds must be matched by one dollar of state or local money. Since local expenditures are not now known, exact figures on the cost of the Kansas program in 1953 are not available, but the total was at least $33,767 since the national contribution was $23,106 and state participation was $10,661.

Your Directory Information Card

The new, 19th edition of the American Medical Directory is now in galley form, and it is expected that the book will be ready for delivery about the middle of 1955. The previous edition was issued in 1950. Since that time, it has not been possible to publish a new edition because changes in the membership structure of the American Medical Association made it difficult to obtain an accurate list of members.

Within the next few weeks, a directory information card will have been mailed to every physician in the United States, its dependencies, and Canada, requesting information to be used in compiling the new directory. Physicians receiving an information card should fill it out and return it promptly regardless of whether any change has occurred in any of the points on which information is requested. It is urged that physicians also fill out the right half of the card, which section requests information to be used exclusively for statistical purposes. Even if a physician has sent in similar information recently, he should mail the card promptly to the Directory Department of the American Medical Association to insure an accurate listing of his name and address. There is no charge for publishing the data, nor are physicians obligated in any way.

The directory is one of the most important contributions of the American Medical Association to the work of the medical profession in the United States. In it, as in no other published directory, one may find dependable data concerning physicians, hospitals, medical organizations, and activities. It provides full information on medical schools, specialization in the fields of medical practice, memberships in special medical societies, tabulation of medical journals and libraries, and statistics on the distribution of physicians and hospitals in the United States.

Tuberculosis Case Finding

Using the number of persons who participate in a project as the criterion for evaluation, the Kansas State Board of Health reports that its tuberculosis case finding program is increasingly successful. The project is now receiving more widespread support than it has enjoyed at any time in the past.

To illustrate the point Dr. James M. Mott, director of the Division of Tuberculosis Control, Kansas State Board of Health, compares figures from a 1952 photofluorographic survey in 33 western Kansas counties with a survey of the same counties in 1954. The mobile survey unit was in the locality 99 days

in the September to December period in 1952. In all, 3,415 persons were x-rayed, an average of 307.2 per day. During the same months in 1954, it required 109 days to x-ray 44,540 persons, an average of 408.6 per day.

Since case finding is the first step in eradication of tuberculosis, it is encouraging to note the large number of people availing themselves of the opportunity to have chest x-rays. Dr. Mott attributes this increased interest in the program to the influence of members of county medical societies and to the cooperation of the people of that area.

Closed-Circuit TV Program

The largest closed-circuit television program ever staged will be presented from 6:00 to 7:00 p.m. (EST) on February 24 under the auspices of the American Academy of General Practice and Wyeth Laboratories. The program will be given by six internationally known authorities who will discuss "How to Control Streptococcal Infection."

The television symposium will originate in CBS studios in New York City and will be transmitted to 57 cities in the United States and Canada. The program will be received at two places in Kansas, Battenfeld Auditorium at the University of Kansas Medical Center, Kansas City, and the auditorium of the Sedgwick County Medical Society, Wichita. At the discussion following the program in Kansas City, Dr. Jesse Rising will be moderator; in Wichita, Dr. George L. Thorpe will be moderator.

It is expected that 15,000 physicians will see the telecast. The Kansas Academy of General Practice has announced that it will be an approved study course for formal credit.

A.M.A. Tours in June

Plans for two vacation trips, an air tour to Europe and a cruise to Bermuda and Nassau, have been announced by the A.M.A. for physicians and their families who wish to travel immediately before or after the A.M.A. convention in Atlantic City, June 6-10.

Four itineraries, each of four weeks' duration, are available for the European tours sponsored by the A.M.A. and Thomas Cook and Son. Departures from New York are scheduled for May 6, May 8, June 11, and June 13. Details are available from A.M.A. Convention Tours, 5959 South Cicero Avenue, Chicago 38, Illinois.

The A.M.A. Bermuda-Nassau party will sail from New York on June 10, docking in New York on the return voyage on June 18. Information may be secured from Mr. W. M. Moloney, Room 711, 105 West Adams Street, Chicago 3, Illinois.

Nominations for 1955-1956

A meeting of the Nominating Committee of The Kansas Medical Society was held at the Jayhawk Hotel, Topeka, on January 9, 1955, and the following names were proposed for the various offices to be filled by vote of the House of Delegates at the annual session in May:

FOR PRESIDENT-ELECT

Dr. Clyde W. Miller, Wichita

FOR FIRST VICE-PRESIDENT

Dr. Conrad M. Barnes, Seneca

FOR SECOND VICE-PRESIDENT

Dr. Thomas P. Butcher, Emporia
Dr. Mahlon H. Delp, Kansas City
Dr. Dwight Lawson, Topeka
Dr. Barrett A. Nelson, Manhattan
Dr. Lloyd W. Reynolds, Hays

FOR CONSTITUTIONAL SECRETARY

Dr. James A. Butin, Chanute

FOR TREASURER

Dr. John L. Lattimore, Topeka

FOR A.M.A. DELEGATE, 1956-1957

Dr. George F. Gsell, Wichita

FOR A.M.A. ALTERNATE, 1956-1957

Dr. John C. Mitchell, Salina
Dr. Glenn R. Peters, Kansas City
Dr. Frederick E. Wrightman, Sabetha

The list of nominees is presented now in accordance with provisions of the Constitution and By-Laws. Additional nominations, of course, may be made from the floor at the time of the election.

Film on Drug Addiction

A film entitled "Drug Addiction—A Medical Hazard" was shown for the first time last month under the sponsorship of the Federal Bureau of Narcotics and the Department of Pharmacology, University of Maryland School of Medicine. It was produced in association with Winthrop-Stearns, Inc., pharmaceutical manufacturer.

The movie was prepared for showing to medical students as an audio-visual teaching tool. It was inspired by an educational program on the dangers of drug addiction initiated 20 years ago at the University of Maryland's School of Medicine by Dr. John C. Krantz, Jr., who prepared the script.

Carcinoma of the Thyroid

Tumor Conference

Edited by Bernard Klionsky, M.D., and Chauncey G. Bly, M.D.

Dr. Bly: Patients with cancer of the thyroid may present many variable pictures of symptoms, signs, and courses. We have chosen one case today to serve as a basis for discussion.

Dr. Santos: This patient is a 62-year-old colored man who had noticed a smooth, firm swelling in the left side of his neck for 30 years. This swelling had rapidly increased in size in the past five to six years and had produced a gradually increasing sensation of choking. Three years ago he first noted pain in the left hip and back. During a physical examination nine months ago to determine the cause of pain, a smooth colloid goiter was noted.

Initial rectal examination revealed only slight prostatic hypertrophy. However, an x-ray revealed a lesion of the sacrum. On deep posterior rectal palpation, a 7 cm. mass could be felt fixed to the anterior surface of the midsacrum. The nature of this mass was undetermined clinically. He entered the hospital two months ago for definitive diagnosis and therapy.

Dr. Bly: Would you discuss the surgical aspects of diagnosis and treatment of this case, Dr. Kittle?

Dr. Kittle: Our initial problem was to decide whether or not the large sacral mass and the goiter were both manifestations of a single disease process. We did not think seriously of a carcinoma of the thyroid because the probability of such a large metastasis to the sacrum seemed unlikely. It was felt that the sacral mass was part of a completely independent disease process.

In considering various primary lesions of the sacrum which might account for this mass, my first choice was a chordoma, which is not uncommon as a primary tumor in this area. This case had all the clinical features of a chordoma. On rectal palpation the mass was found to be extraluminal. It apparently had been growing only slowly. People with chordomas do have various types of low back pain, which may be continuous and may radiate down the leg. This patient had had severe pain in the left lower back, left heel, and left calf for three or four years. The pain was intermittent, worse at rest, and aggravated by coughing and straining. Roentgenologic examination showed the process to be osteolytic.

Second in the list of possible diagnoses was some type of sarcoma or other primary bone tumor arising from the sacrum. Third was the scant possibility of an aortic aneurysm. However, the mass did not feel like an aneurysm and it had a most unusual location. We considered doing a needle biopsy of the mass, but again, because of the faint possibility of its being an aneurysm, this was not attempted. Among the possibilities for metastatic tumor masses, renal carcinoma was considered.

Therefore, our preoperative impression was that a large colloid goiter had been present for many years and had recently begun to grow more rapidly, causing obstructive symptoms of dyspnea and dysphagia. Surgery was directed to the relief of these symptoms. At the time of the thyroidectomy the gross diagnosis was still colloid goiter, and we were content to do a subtotal throidectomy, leaving the right side intact. A nearby lymph node, biopsied because of the remote possibility of carcinoma of the thyroid, was grossly negative.

Dr. Bly: Dr. Germann, would you demonstrate the x-ray films on this patient?

Dr. Germann: We have, of course, many films on the man. The first shows the large, smooth, soft tissue mass in the left side of the neck (Figure 1). Several others show the rather large osteolytic lesion

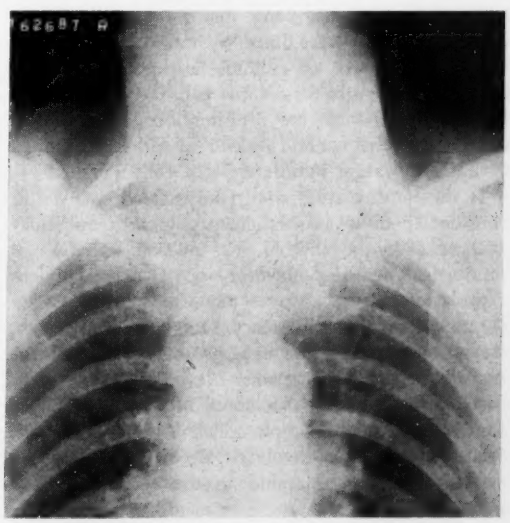


Figure 1. Roentgenogram (A-P) of chest showing smooth bulging soft tissue mass in the lower half of the left side of the neck.

Cancer teaching activities at the University of Kansas Medical Center are aided by grants from the National Cancer Institute, U. S. Public Health Service, and the Kansas Division of the American Cancer Society. Dr. Klionsky is a Trainee of the National Cancer Institute.

in the sacrum with destruction of both sides of the sacrum itself (Figure 2). The lateral film shows extensive involvement of the upper three sacral segments. We cannot tell precisely by the films how far

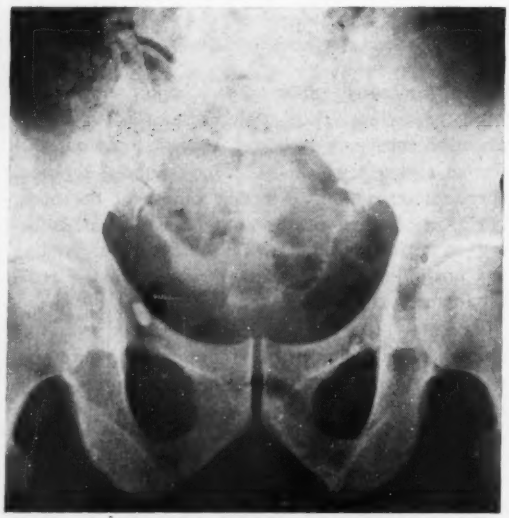


Figure 2. Roentgenogram of pelvis and sacral spine showing osteolytic destruction of the upper three sacral segments.

anteriorly the mass extended. Films taken of other regions in a skeletal survey revealed no other lesions of bone.

Dr. Bly: Dr. Boley, will you tell us something about the gross and microscopic characteristics of the thyroid tissue removed surgically?

Dr. Boley: The specimen of thyroid weighed 250 grams and was from the left lobe. Many microscopic sections were studied, and the findings were similar. Large acini were lined by tall columnar cells, without scalloping of colloid. Sections from other areas of the thyroid mass show papillary architecture. In other areas there are proliferations of small immature acini that contain no colloid and small groups of uniform, larger undifferentiated cells (Figure 3).

If these many areas were encapsulated, we would consider them to be benign papillary or follicular adenomas of the thyroid, for nuclear variation is minimal. There is, however, no evidence of encapsulation. These changes are also so diffuse that we must diagnose malignancy. Despite careful search, we were unable to find evidence of invasion of the capsule or of blood vessels. Nevertheless, we must interpret the case as carcinoma of the thyroid. No tumor was seen in lymph nodes. Although the left lobe was diffusely involved, we of course cannot say what might be found in the remaining right lobe.

Dr. Kittle: As you may imagine, we were surprised to learn the definitive diagnosis in this case since neither the clinical story nor the gross surgical findings pointed to carcinoma. It certainly is the duty of every surgeon to do his very best, at the time of thyroidectomy, to decide from the gross appearance and relations of tissue whether or not the patient has carcinoma of the thyroid. Often this may be very difficult or impossible, as in this present case. The surgeon should, when in doubt, consult with the pathologist to have him help examine the thyroid and make multiple gross and frozen sections.

If a diagnosis of malignancy is suspected and can definitely be made at the time of the initial operation, the surgeon should proceed with a total thyroidectomy. This is the operative procedure of choice in the surgical treatment of carcinoma of the thyroid. Lymph node dissection may also be performed, depending on the morphology of the tumor and the extensiveness of clinically demonstrable spread. Radioactive iodine has a greater opportunity to localize in functional metastases if the thyroid gland itself has first been removed.

To help us determine whether to do further surgery on this patient, the radiology department in-

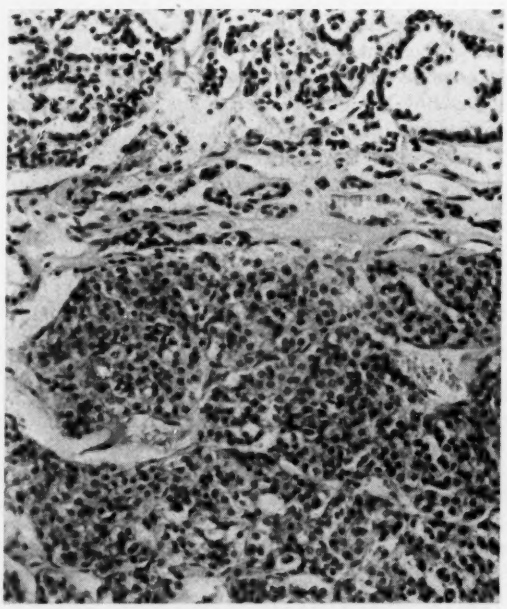


Figure 3. The upper half of field shows colloid-containing thyroid acini. In the lower half there are many small immature acini and undifferentiated cells.

stituted studies with radioactive iodine. We were particularly interested in knowing whether or not the sacral mass represented a peripheral metastasis of functional thyroid tumor tissue.

Dr. Germann: During our initial tracer studies

one week after subtotal thyroidectomy, we tried to determine first the total uptake and, second, the sites of localization of the orally administered dose of radioactive iodine. We hoped that the tumor would be functional and take up I^{131} so that any remaining tumor might be localized and destroyed. Only about 15 per cent was found in the neck of patient, even though the right lobe of the thyroid was still intact.

When we surveyed the patient with the scanning counter, an extremely high amount of radioactivity was found to be localized in the sacrum. About 50 per cent of the iodine was excreted in the patient's urine in the first 48 hours. Therefore, we felt that the remaining 35 per cent was in the sacrum. Since this thyroid carcinoma tissue had shown such high uptake, he was given 90 millicuries of radioactive iodine six weeks ago. That was an adequate dose, although I think he might have tolerated more.

A week after this therapy it was roughly calculated that there were still about 25 millicuries of radioactive iodine in this sacral mass. Knowing this, we placed the patient on his back with an unexposed x-ray film under his sacrum for five minutes to effect proper film exposure. The developed film shows a large central irregular black area. This does not delineate any anatomical detail but does show the large general areas of rather uniform concentration from which the radiation was being emitted.

We saw the patient again one week ago, or five weeks since his treatment with I^{131}. We wanted to do repeat tracer studies to determine whether any of the tumor and its uptake had been destroyed. However, he still had so much residual iodine in his sacrum that new tracer studies were impossible, because the background count would be too high. We estimated that there was still about one millicurie of I^{131} present in the mass. Repeat x-ray films of the pelvis at this time revealed no appreciable changes in the size of the lesion. Clinically, there had been no change in the sacral mass or in the patient's back pain.

Dr. Bly: At this point, then, we are discussing a patient who has had a large mass of highly functional low-grade papillary adenocarcinoma of the thyroid removed by subtotal thyroidectomy. The remaining functional thyroid tissue, including one large mass of functional tumor tissue in the sacrum and possibly other undetectable tumor metastases in the skeleton or in the right lobe of the thyroid, has been given one treatment with 90 millicuries of I^{131}. A longer follow-up will be needed to evaluate this treatment. Dr. Germann, do you think that repeated courses of I^{131} will suffice to cure this patient?

Dr. Germann: I cannot, of course, predict that with certainty. It will depend not only upon whether the lesion continues to absorb sufficient radioactive iodine, but upon how sensitive the tumor tissue is to the internal radiation. We can evaluate neither of these as yet.

I would like to ask if all patients with carcinomas of the thyroid should have total thyroidectomy. That has not always been the universal attitude. I have seen several patients who, following removal of simple adenomas with invasion, have done well without either total thyroidectomy or radioiodine therapy.

Dr. Kittle: I agree there is room for variation of opinion. Almost any one of several therapeutic methods which can be applied in the management of low grade thyroid malignancies will give good results. In contrast, for patients with highly malignant forms of carcinoma of the thyroid, the prognosis is poor, no matter what is done. I don't know what the final decision will be. I don't believe that a surgeon could be criticized if he did not do a total thyroidectomy in treatment of a solitary adenoma; however, I believe that a complete hemithyroidectomy on the involved side should be performed. In this particular case, if any residual tumor can be demonstrated in the thyroid itself, I think we should destroy the remaining thyroid tissue, either by surgical excision or possibly by external irradiation.

Dr. Bly: Dr. Allen, can you as an internist help us with this particular patient?

Dr. Allen: I saw this patient after his thyroidectomy. I think that the type of clinical story which this patient had is not uncommon for patients with carcinoma of the thyroid and skeletal metastases. In most such patients, the diagnosis is not obvious. An even more confusing picture develops in cases of multiple metastases; in those cases, multiple myeloma is frequently offered as the most likely diagnosis.

I can recall at least three patients with metastases of thyroid tumor in whom there was no obvious primary tumor of the thyroid gland. One patient was first seen with a backache due to compression fraction of a thoracic vertebral body. We palpated the thyroid and found nothing. On careful reexamination later, we did palpate a small nodule, low in the lower fold of the left lobe of the thyroid. It was found at surgery and turned out to be carcinoma.

It is important to remember that the primary tumor may either seem insignificant or be undetectable at all. In any case in which there are skeletal metastases of unknown origin, or in patients in whom myeloma seems to be the diagnosis but the bone marrow biopsy studies are negative, a careful pointed search must be made for carcinoma of the thyroid, both by palpation of the gland and by radioactive isotope studies.

In regard to the problem of whether or not to do a total thyroidectomy in patients with carcinoma of

the thyroid, I think it depends on whether or not there are known metastases. If there are known metastases, and you intend to treat the patient with radioactive isotopes, then one should by all means do a total thyroidectomy of some type, either by surgery or by some external radiation. The reason for this is that, in most cases, one will not be able to induce the metastases to take up the minimum effective amount of iodine until the main thyroid gland is gone.

I think that it is unusual that the metastasis in today's case took up so much iodine with so much of the thyroid gland remaining. It's an old clinical observation, antedating radioisotopes, that in a patient with carcinoma of the thyroid, failure to develop myxedema after thyroidectomy implies metastases. We have often seen that happen in our series here. This man today has had no myxedema at all, implying that he still does have functioning thyroid tissue; we of course know that the entire right lobe was left intact at operation. I feel that if any known metastases are present, as in this case, total thyroidectomy should be completed so that one can treat the metastases more effectively with radioactive iodine.

In the process of working up some of these puzzling patients, pyelograms are frequently done to rule out renal cell carcinoma. Gallbladder visualization may also be done in the search for an obscure primary cancer. However, in such a search for a primary tumor, any use of iodine-containing radio-opaque dyes will interfere with the uptake of radioiodine. Therefore, the radioisotope studies should precede the radio-opaque dye studies.

The radioisotope laboratory must of course be briefed on what is desired. Often one will give at least five times the usual tracer dose of I^{131} and then scan particularly the thorax, back, pelvis, and long bones. If the thyroid tumor is of the more anaplastic cell type, with poor differentiation and function, one can sometimes tease or induce the tumor cells to take up more radioiodine by the administration of an antithyroid compound for several days prior to giving the I^{131}. Again, all normal thyroid tissue should have been removed if possible. Large doses of a blocking drug such as propyl-thiouracil or methimazole are administered in this conditioning process.

If propyl-thiouracil is used, one should give at least 300 mg. a day for a period of about two months, if the patient can tolerate it. During that period of time, a state of myxedema will be developed, if there is sufficient interference with iodine metabolism, and an increase in thyroid-stimulating hormone (TSH) from the pituitary will be thus produced. The effects of TSH on the tumor cells may stimulate an increased affinity for iodine.

The blocking agent or drug is then withdrawn, and about 10 days later a tracer dose of I^{131} is given. If the metastases have then taken up iodine, the administration of a full therapeutic dose of I^{131} is indicated. This procedure can be repeated several times. However, blocking agents should not be given during the next month or so following the administration of a therapeutic dose of radioactive iodine.

Student: Does this same type of procedure also apply in the therapy of hyperthyroidism with radioactive iodine?

Dr. Allen: Yes. Blocking agents hasten exclusion of the iodine from any thyroid tissue, including the normal thyroid tissue. If a patient has already been treated with radioactive iodine for hyperthyroidism, one should probably wait several weeks before giving any such blocking substances. They are contraindicated during these weeks immediately after isotope therapy, because their administration will hasten the elimination of the radioactive iodine from the gland, and the biological half-life of the isotope in the gland may become too short to be effective.

On the other hand, radioiodine can be effectively given to patients with hyperthyroidism as soon as five to eight days after withdrawing the blocking drugs. As a matter of fact, to patients with very hyperactive thyroid tissue and recurrent thyrotoxicosis, we have given radioiodine as shortly after blocking agent withdrawal as two to three days, with gratifying effect. Actually, one can give intramuscular TSH itself to stimulate I^{131} uptake more directly in any of these procedures.

Dr. Bly: I am sure that you are all familiar with Cohnheim's old theory, in the last century, that masses of well differentiated thyroid tissue in the cervical lymph nodes or bones and other sites of blood-borne metastases were either "lateral aberrant thyroid" or "benign metastasizing goitre." These concepts have been reviewed by Willis[1] and have been abandoned by present-day pathologists. However, they are of historical interest in this case where, apparently, we have a sacral mass of fairly well-differentiated but very "aberrant" thyroid tissue functionally picking up iodine. This is certainly a functional metastatic mass in the sacrum, although we can as yet say nothing about its histology or its dependence upon the existence of thyroid-stimulating hormone (TSH) in the body for its continued growth and extension.

Dr. Tice, will you tell us something about the use of direct external radiation to various areas of known metastases, to areas of primary carcinoma which might be remaining in the thyroid, or to microscopic areas which might now be present in lymph nodes but not appear until later?

Dr. Tice: I feel that in most cases of carcinoma

of the thyroid, supplemental irradiation of some sort should be given. Any residual normal or tumorous thyroid tissue may take up radioactive iodine; if so, that may be the ideal approach. However, if radioactive iodine is not successful, external radiation is the choice. One would use two lateral ports and an anterior port for the thyroid region of the neck. Possibly the patient may need a tracheotomy following irradiation. An external dose of about 5,000 r provides a thyroid dose of 4,800 r.

There is a great deal of variation in the radiosensitivity of thyroid tumors. The anaplastic thyroid tumor is often not so radiosensitive as anaplastic tumors of other tissues. In one series of 500 cases treated with radiation, there was a five-year life expectancy of 20 to 70 per cent, depending on the tumor type. Papillary tumors had as high as 70 per cent five-year survival, while the anaplastic tumors and giant cell tumors had at best a 20 per cent survival. I think radiation is a good supplementary treatment in the average case of carcinoma of the thyroid. Surgery, of course, is the first choice of treatment if the patient is strong enough.

Dr. Bly: Dr. Kittle, it has been often stated that there is a high correlation between solitary adenoma of the thyroid and the development of carcinoma. Would you elaborate on that correlation for us?

Dr. Kittle: There is a high correlation between the existence of adenomas, either solitary or multiple, and the development of carcinoma in the thyroid. Such nodules should be excised particularly if solitary, since they are often considered to be premalignant lesions. Estimates vary in the literature, where one can find reports that carcinoma of the thyroid will develop in as few as 5 per cent and in as many as 50 per cent of all solitary untreated adenomas of the thyroid.

I can recall the case of a surgical nurse at our own hospital. She had, no doubt, assisted at many thyroidectomies. She knew that she had a solitary nodule, and she had been advised by several people to have it removed. She insisted that it caused her no difficulty and refused surgery. Three or four years later the nodule was finally excised and was found to be a low-grade papillary adenocarcinoma. By that time, however, a cervical lymph node also contained tumor.

Ward and Hendricks,[2] from Johns Hopkins Hospital, summarized their experience with some 112 cases of carcinoma of the thyroid. In this series, there were 23 solitary nodules in the thyroid and, of these, 20 were in an aberrant position. These would now be called metastases, rather than lateral aberrant thyroid nodules. In 16 of the 112 patients there were multiple nodules, and in 5 patients the nodules were bilateral. In another 23 of the 112 cases there was diffuse involvement of the entire gland; and in 10 other patients only one lobe was diffusely involved.

Histologically, 61 of the 112 carcinomas were papillary adenocarcinomas of low-grade malignancy. Thirty-seven were classified as alveolar adenocarcinomas of the thyroid, or Hürthle cell tumors, of middle-grade malignancy. The remaining 14 were such tumors as giant cell carcinoma, epidermoid carcinoma, or small cell carcinoma, of high-grade malignancy. Thus, the usual carcinoma of the thyroid is of low-grade malignancy.

Thyroid carcinoma may appear at any age, in young children as well as in elderly patients. The thyroid is the site of one of the most common carcinomas of the neck in children. Carcinoma of the thyroid is relatively frequent in young girls. It seems to have a special predilection for females.

With regard to the association of thyrotoxicosis with carcinoma of the thyroid, 30 of the patients in this series had symptoms of hyperthyroidism, and the basal metabolic rate was elevated in 24.

Dr. Allen: This report of a high degree of association is at considerable variance with other reports. Of course an elevated basal metabolic rate does not establish the diagnosis of thyrotoxicosis. Many other authors have pointed out the very low coincidence of thyrotoxicosis and malignancy of the thyroid. Some have said that as few as one in 1,000 patients with thyrotoxicosis will also have carcinoma. I have never personally seen such a combination of diseases. Therefore, when confronted with a patient who has both a nodular goiter and thyrotoxicosis, we feel relatively assured of the benign nature of the lesion.

Student: I would like to ask Dr. Allen if he would recommend excision of an asymptomatic solitary nodule discovered during a routine physical examination, and if it would make any difference if the nodule was functional and took up radioiodine.

Dr. Allen: I would recommend excision whether the nodule was functional or not. My position would alter if the individual also had thyrotoxicosis, of course, as I mentioned before. I would then be willing to treat him with radioactive iodine and follow him closely. If the nodule had not almost completely disappeared to palpation within two or three months, I would then recommend surgical extirpation. We have followed this procedure with several patients. In those in whom the nodule failed to regress, the surgical specimen showed only nodular hyperplasia.

Distinction must be drawn between types of nodules whenever possible, of course. The hypertrophied colloid goiter and the recurrent goiter may also be irregular and nodular in form, yet not contain adenomas or carcinoma.

Dr. Kittle: Not all solitary thyroid nodules are or become carcinoma. On the other hand, some investigators claim that as high as 80 per cent of all carcinomas of the thyroid have begun in fetal adenomas. This seems too high to me. Furthermore, I don't know how one can be sure in any case how or when the carcinoma began. Morbidity and mortality following thyroidectomy are so low that one should not defer surgical therapy of the solitary thyroid nodule.

Dr. Bly: It was once proposed that the surgeon do serial biopsies of these nodules to see periodically what the cells look like. However, histologic criteria for malignancy in the thyroid are difficult to define, even when known metastases are present. Several people, including Dr. Harry Greene, have proposed using biological criteria, such as the heterologous transplantation of tumor tissue into the guinea pig eye. Repeated biopsy and transplantation of a patient's tumor may help tell when the benign or dependent tumor has become autonomous or malignant. Certainly it is probable that some adenomas are malignant from their inception. Often an encapsulated nodule or adenoma is either wholly malignant or wholly benign throughout.[3]

Dr. Klionsky: Willis reviews older reports that in endemic goiter areas up to 4 per cent of all cancers are thyroid cancers, whereas in other areas only 0.5 per cent were. In other words, the incidence of thyroid carcinoma was thought to be six to eight times higher in endemic goiter areas. However, Sokal[4] attempts to refute both this classic concept and also the one that uninodular goiter is more apt to contain carcinoma than the apparently benign goiter which contains no nodules.

Dr. Allen: I heard recently of a study of thyroid disease in the mountains of Peru by an investigative group who brought along their own complete laboratories. Although endemic goiter was present in about three out of every four people in the area, cretinism was uncommon and carcinoma was rare. This, too, would make us wonder about some of our older concepts.

Dr. Bly: It has been pointed out[3, 4] that currently thyroid cancer is more common among hyperthyroid than euthyroid patients. Therapy with blocking drugs and radioiodine is almost restricted to hyperthyroid patients. The fact that thyroid tumors have been produced in animals with these therapeutic agents[5, 6] or with iodine-deficient diets[7] should discourage prolonged indiscriminate and needless use of these drugs.

Editor's note: Follow-up examination was performed on this patient 5 months later. Radioiodine studies reveal a total uptake of only 2 per cent in 24 hours. The radioactivity count over the sacral mass is markedly decreased as compared with the initial determination. No significant change can be noted in the radiographic appearance of the sacral mass. No further sites of metastasis can be demonstrated.

BIBLIOGRAPHY

1. Willis, R. A.: Pathology of Tumours. Second Edition. London, Butterworth & Co., Ltd., 1953.
2. Ward, G. E., and Hendrick, J. W.: Tumors of the Head and Neck, pg. 647. Baltimore, The Williams and Wilkins Company, 1950.
3. Pemberton, J., and Black, B. M.: Cancer of the Thyroid, a monograph of the American Cancer Society, 1954.
4. Sokal, J. E.: Incidence of malignancy in toxic and nontoxic nodular goitre, J.A.M.A. 154:1321-1325 (April 17) 1954.
5. Van Dyke, J. H.: Experimental thyroid tumorigenesis in rats, Arch. Path. 56:613-628, 1953.
6. Doniach, I.: Effect of radioiodine alone and in combination with methylthiouracil and acetylaminofluorene upon tumour production in the rat's thyroid gland, Brit. J. Cancer 4:223-234, 1950.
7. Bielschowsky, F.: Chronic iodine deficiency as cause of neoplasia in thyroid and pituitary of aged rats, Brit. J. Cancer 7:203-213, 1953.

Make hotel reservations now for the 1955 meeting of The Kansas Medical Society, Hutchinson, May 1-5.

DEATH NOTICES

Irl Edwin Hempstid, M.D.

Dr. I. E. Hempstid, 63, who had practiced in Hutchinson since 1920, died at his home there on December 19. He had been in poor health for several years and had been critically ill for 10 days before his death.

A graduate of St. Louis University School of Medicine, 1915, Dr. Hempstid began practice in Burrton. During World War I he served in the Army. His practice was limited to surgery, and he was a fellow of the American College of Surgeons. He was an honorary member of the Reno County Medical Society.

Robert B. Stewart, M.D.

Dr. Robert B. Stewart, 75, a former member of the Editorial Board of the Journal of the Kansas Medical Society, died in a Los Angeles hospital on January 19. He had practiced in Topeka for a number of years before 1938, when he moved to California and became chief of the surgical staff of Queen of Angels Hospital, a position from which he retired about a year ago. He was a graduate of Kansas Medical College, Topeka, with the class of 1903. A brother, Dr. James G. Stewart, Topeka, is among the survivors.

ACTIVITIES OF MEMBERS

A paper which was published in the JOURNAL in October, "The Value of Gastroscopy," by Dr. Henry Laurens, Jr., Salina, was reprinted in condensed form in the November issue of *Digest of Ophthalmology and Otolaryngology.*

Dr. Wendell A. Grosjean, of the Snyder Clinic, Winfield, has been notified of his election to fellowship in the American Association for the Surgery of Trauma.

Dr. George J. Pierron, Olathe, has begun a two-year tour of duty with the Army. He reported at Fort Sam Houston in January. During his absence his practice will be cared for by his associate, Dr. William McCann. After he completes his internship at the Kansas City General Hospital in July, Dr. Robert Fenton will also assist with Dr. Pierron's practice.

Dr. Lambert A. Kerr, Lincoln, who has been in practice for 46 years, announced his retirement on January 1.

Dr. Walter L. Schafer, Wichita, was recently elected an associate fellow in the American College of Allergists.

Dr. Lee H. Leger, Kansas City, was speaker at a meeting of the Leavenworth Rotary Club last month. His subject was heart disease.

Dr. George H. Hassard has announced plans to leave Sedan to study for a specialty practice. His general practice in Sedan has been taken over by Dr. William K. Walker, formerly of Cedar Vale.

Dr. William L. Warriner, Topeka, was one of seven physicians over 88 years of age who were interviewed by a reporter for the United Press. The resulting article on longevity was published in many newspapers throughout the country.

Dr. and Mrs. Francis M. Coffman, Ford, who recently celebrated their 50th wedding anniversary, were guests of honor at a celebration held at the Ford Methodist Church. Dr. Coffman has been practicing there since 1910.

Dr. C. J. Kurth, Wichita, spoke on "Business and Mental Health" before the January meeting of the Hypatia Evening Club in Wichita.

The Snyder Clinic, Winfield, announces that two new physicians are now members of its staff, Dr. Franklin R. Miller, hematologist and head of the department of internal medicine, and Dr. Charles G. Foster, of the department of internal medicine and radioisotopes.

Dr. DeMerle E. Eckart, Hutchinson, was recently elected to active membership in the New York Academy of Sciences.

Dr. Paul C. Laybourne, of the University of Kansas School of Medicine, took part in a program presented by the Oklahoma Academy of General Practice on February 14 and 15 in Oklahoma City. He presented two papers, "Treatment of Common Emotional Problems of Children" and "Preventive Child Psychiatry."

Dr. S. Paul Hornung, who was released from the Army in January, has announced plans for the opening of an office in Norton. Before entering the service he practiced in Dodge City.

Dr. Rene M. Gouldner, Wichita, was guest speaker at the January meeting of the Sedgwick County Medical Assistants' Society. He spoke on "Recollections of My Trip Around the World."

Dr. Paul D. Adams, Osage City, was recently called to active duty with the Air Force and reported at the Air Force School of Aviation Medicine, San Antonio.

Dr. James H. Holt, Wichita, has been named director of the Wichita University Health Service.

Dr. Lucien R. McGill, Great Bend, has been declared coroner of Barton County. Although he did

not file for the office before last November's election, Dr. McGill was elected on the basis of a write-in vote.

Dr. Henry S. Blake, Topeka, has been elected a trustee commissioner of the National Blue Shield Commission. In that position he will represent Arkansas, Arizona, Colorado, New Mexico, Oklahoma, Texas, Wyoming, and Kansas and part of Missouri.

Cancer Conference in Wichita

Kansas physicians will have an opportunity to learn of new developments in cancer therapy on March 24 and 25 when the seventh annual Mid-West Cancer Conference will be presented at the Broadview Hotel, Wichita. Co-operating agencies are the Kansas Division of the American Cancer Society and the Committee on Control of Cancer of The Kansas Medical Society. No registration fee will be charged.

Attendance at such conferences grows each year, and it appears that more physicians than usual will be present this year to hear the eight nationally known speakers, two surgeons, two pathologists, two radiologists, one oncologist, and one director of biological research.

The complete list of speakers includes the following: Dr. Richard Chamberlain, radiologist, Philadelphia; Dr. Elson B. Helwig, pathologist, Washington, D. C.; Dr. C. C. Little, research director, Bar Harbor, Maine; Dr. John R. McDonald, pathologist, Rochester; Dr. Robert Dulaney Moreton, radiologist, Fort Worth; Dr. J. Herbert Nagler, oncologist, Philadelphia; Dr. George T. Pack, surgeon, New York, and Dr. Henry K. Ransom, surgeon, Ann Arbor.

Short biographical sketches on Dr. Moreton and Dr. Little were published in the December issue of the JOURNAL, and data about Dr. Helwig, Dr. Pack, and Dr. Nagler appeared last month. The paragraphs below will complete the series.

Dr. Richard H. Chamberlain is professor of radiology at the School of Medicine and Graduate School of Medicine, University of Pennsylvania. A diplomate of the American Board of Radiology, Dr. Chamberlain serves as consultant in radiology for the United States Public Health Service and is a member of the Committee on Isotope Distribution of the Atomic Energy Commission and of the International Commission on Radiological Units. He is also chairman of the Commission on Radiological Units, Standards and Protection and a member of the National Committee on Radiation Protection.

Dr. John R. McDonald, a diplomate of the American Board of Pathology, is well known in his field. He directs the Section on Surgical Pathology at the Mayo Clinic and is professor of pathology of the Mayo Foundation Graduate School, University of Minnesota. He serves as a consultant in cytology for the American Society of Clinical Pathologists, is a fellow of the American College of Chest Physicians and the College of American Pathologists, and is a councilor of the American Association of Clinical Pathologists.

One of the surgeons on the program is Dr. Henry K. Ransom, Ann Arbor, professor of surgery at the University of Michigan Medical School. He is a diplomate of the American Board of Surgery, a fellow of the American College of Surgeons, and a member of the American Surgical Association, Central Surgical Association (president in 1949), and International Surgical Society. He was graduated from the University of Michigan Medical School in 1923.

More detailed information on the conference may be secured from the Kansas Division, American Cancer Society, 824 Tyler, Topeka, Kansas.

Television at 15 Postgraduate Meetings

Closed-circuit color television programs will be presented at 15 postgraduate medical meetings in 1955 by Smith, Kline and French Laboratories, according to a recent press release. It is estimated that 60,000 physicians will view the programs.

Smith, Kline and French Laboratories presented the first color television in June 1949 at the annual meeting of the A.M.A. Since that time they have given telecasts for 65 medical meetings at which more than 327,000 doctors were in attendance. To carry out such a schedule, a ten-man unit devotes its entire time to production of the telecasts and maintenance of 18,000 pounds of equipment. The unit is unique in the industry in that it is the only completely mobile television station in existence.

One of the 15 meetings at which television will be shown in 1955 is the session of the Kansas City Southwest Clinical Society, Kansas City, Missouri, October 4-6.

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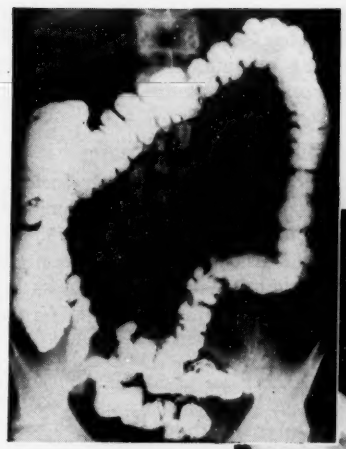

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COUNTY SOCIETIES

Dr. Peter S. Combs, Leavenworth, is serving as president of the Leavenworth County Medical Society this year. Dr. Robert H. Moore, Lansing, is vice-president, and Dr. Carroll D. Voorhees, Leavenworth, is secretary.

A meeting of the Shawnee County Society was held in Topeka on January 3. Dr. John Lamb, Oklahoma City, spoke on "Sunlight Dermatoses."

Dr. Lee H. Leger, Kansas City, was installed as president of the Wyandotte County Society at a dinner dance given at the Town House Hotel on January 8. Other officers are: Dr. Gaylord P. Neighbor, vice-president; Dr. Leland Speer, secretary; Dr. Frank A. Rieke, treasurer, and Dr. Chester L. Young, member of the board of censors. Elected to three-year terms as delegates to The Kansas Medical Society are Dr. Wray Enders, Dr. Agnes L. Robbins, and Dr. C. L. Francisco.

Two speakers took part in the program presented at the regular meeting of the Wyandotte County Society on January 18. Dr. Charles A. Hunter spoke on "The Effect of Paravertebral Anesthesia on Uterine Motility," and Dr. George A. Higgins, chief of surgery at the VA Hospital in Kansas City, Missouri, discussed "Management of Spontaneous and Traumatic Pneumothorax."

Members of the Saline County Society were hosts to the Golden Belt Medical Society at a meeting held at the Salina Country Club on January 13. Dr. V. M. Winkle, of the Kansas State Board of Health, spoke on "The Local Health Officer—the General Practitioner of Public Health." The second part of the program was devoted to a discussion of "Congenital Malformation of the Nervous System," and Dr. D. Bernard Foster and Dr. Robert P. Woods, both of the Menninger Foundation, Topeka, outlined medical management and surgical treatment.

Dr. Aldo A. Luisada, director of the Division of Cardiology, Chicago Medical School, spoke on "Left Ventricular Failure and Pulmonary Edema: Mechanism and Therapy" before the January 4 meeting of the Sedgwick County Society at Wichita. That afternoon the society inaugurated its plan of holding an informal clinic at a Wichita hospital on the day of a scientific evening meeting. Dr. Ben M. Matassarin was moderator and Dr. Luisada conducted the clinic.

At a meeting of the Johnson County Society, held at Redwood Inn, Olathe, Dr. Donald J. Smith, Overland Park, was named president for 1955. Dr. Edward J. Schulte, Mission, was elected vice-president; Dr. David J. Buddrus, Prairie Village, secretary; Dr. Robert E. Riederer, Olathe, and Dr. George R. Maser, Mission, delegates.

Fight Against Polio

The polio attack rate in Kansas in the year just concluded was about 57 per cent higher than the national average, according to provisional reports of the National Foundation for Infantile Paralysis. Nationwide, the number of cases reported in 1954 was the third highest on record.

Kansas also had a high polio attack rate in the year 1952, when 1,718 polio cases were reported. This record was also higher, by 134 per cent, than the national average for that year. It is impossible to predict when and where polio epidemics will strike, which underlines the need for more effective control measures.

Evaluation of the Salk vaccine, administered to 440,000 U. S. children in the largest medical experiment of its kind ever conducted, is now in progress. Announcement of the vaccine's effectiveness will be made in the spring of 1955.

During the field trials last spring about 8,000 children in Kansas were inoculated with the Salk vaccine.

This year the March of Dimes must do a bigger job than ever before. It must raise $64,000,000—because $9,000,000 is needed to purchase vaccine, $2,700,000 for scientific research, $2,900,000 for professional education, and at least $29,900,000 for patient aid, including hospitalization. The March of Dimes has expended $203,600,000 in patient aid since 1938.

Catalogue of Health Booklets

A catalogue of A.M.A. publications available for distribution to patients was issued recently by the A.M.A. Bureau of Health Education. Hundreds of pamphlets on personal and family health problems are listed. Copies of the catalogue are available on request.

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1. American Medical Association: New and Nonofficial Remedies. J. B. Lippincott Co., Philadelphia, 1954, p. 147.

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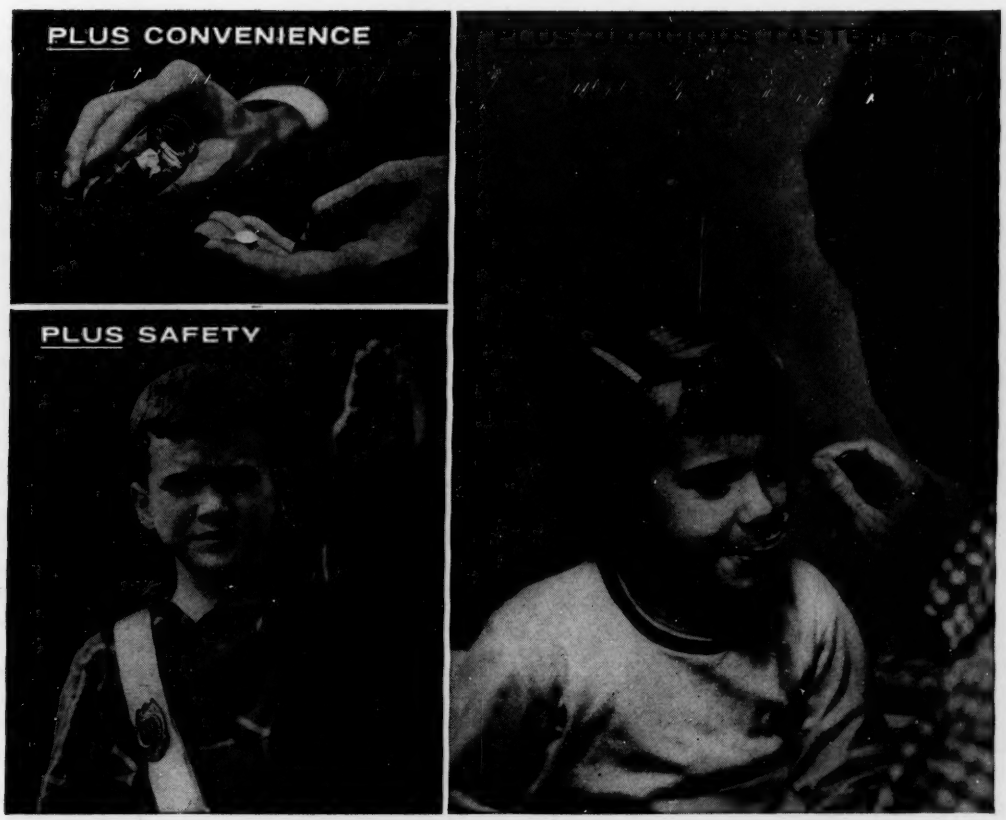

Johannes Müller, Father of Scientific German Medicine

Thomas J. Fritzlen, M.D.
Denver, Colorado

The great place in 19th century medical science held by Germany did not have its beginnings in antiquity, nor did it come about as a gradual evolution of thoughts and ideas about medicine. It was rather the consequence of the revolutionary work of a few pioneers who led the way to a rational and scientific approach to medicine. One of these and, in fact, one of the greatest biologists of all time was Johannes Müller. His ceaseless investigations into far-flung and separate fields of medicine and natural science, his remarkably successful method of rational experiment and observation, and his influence as a teacher as reflected by the fame and success of his pupils have all combined to earn for him the high place which he holds in the history of medicine.

Johannes Peter Müller was born in Koblenz on July 14, 1801, the eldest of five children of a fairly prosperous shoemaker. His father died while Müller was still a boy, but his mother was able to manage her husband's business successfully with the aid of assistants, and when young Johannes began to entertain the idea of becoming a Catholic priest his mother was able to allow him to pursue his education seriously. Accordingly, he was entered in the *Sekundar Schule* in Koblenz, a former Jesuit college, in 1810, and undertook a classical education.

He acquired an excellent training in Latin and Greek and made his own translations of Plato and Aristotle, acquiring in the process a lifelong reverence for the latter's observations on natural phenomena. He also became interested in Goethe's works, especially those which concerned themselves with scientific subjects. He was an avid collector in these school days, gathering many of the species of insects in the neighborhood. After the fall of Napoleon, the Rhineland came under the Prussian government, and the curriculum of the schools became directed along more precise and scientific lines. This further channeled young Müller's studies, and by the end of his training in the *Sekundar Schule* in 1817 his inclinations were beginning to be turned away from the priesthood and more and more toward a study of natural science.

After a period of compulsory military service, enlivened only by several humorous incidents in consequence of his ceaseless investigative spirit, he entered the University of Bonn in 1819. Upon starting at the university, he finally made his decision in favor of science over theology and began the study of medicine. He applied himself with enthusiasm to his studies, especially in anatomy and physiology, and soon became so impressed with his new fields of endeavor that he made the statement: "Whatever cannot be demonstrated by the scalpel, does not exist." It was not long his viewpoint, and was important only in that in later years opponents to his broad conclusions drawn from observed data would recall it to embarrass his position.

In 1821, the university announced that its first prize would be given for the best paper dealing with the subject of the respiration of the fetus. Müller devoted every bit of his spare time to this project, and, devising a series of experiments which brilliantly cleared questionable points, he was awarded the prize.

He received his doctorate in medicine at Bonn in 1823, and from there went to Berlin, which at that time was the Mecca of higher education in Germany. He spent a year and a half at the University of Berlin, working under the direction of Karl Rudolphi, professor of physiology. His work, dealing especially with the mechanisms of phonation, was carefully and thoughtfully carried out and when he left Berlin, Rudolphi presented him with an English microscope in appreciation for his work and that he might better continue his investigations in the future.

On returning to Bonn in October of 1824, he began lecturing in the university as a Privat-Docent and also set up in the practice of medicine. This latter activity provided rather meager income since Bonn, a city of 30,000, already had 18 full-time medical practitioners. A few months after he had opened his practice, a friend under his care died of peritonitis, and Müller forthwith gave up all ideas of practicing medicine and devoted all of his time to teaching and research. He began at this time an extensive investigation of rather metaphysical phenomena, dealing with such things as religious visions, *déja vu*, visual hallucinations, dreams during various stages of wake and sleep, and phenomena of the optic nerve and of vision. He published his findings in a paper with the rather formidable title, "Ueber die phantastischen Gesichtserscheinungen," in 1826.

Concurrently he was conducting a series of intro-

This is one of 11 theses, written by fourth year students at the University of Kansas School of Medicine, selected for publication by the Editorial Board from a group judged to be the best by the faculty at the school. This thesis won the $100 D. C. Guffey prize for papers on the history of medicine, May 1954.

Dr. Fritzlen, who is now interning at Colorado General Hospital, translated the original German literature listed in the bibliography.

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spective observations, noting the effects on his mental acuity of prolonged fasting and abstinence from sleep, attempting to produce in his imagination visual impressions with all of the reality of actual sight, and acquiring voluntary control of the size of his pupils by long hours of practice before a mirror. These depleting activities and the nature of his recent metaphysical studies, treading as they did along the sometimes narrow boundary between science and philosophy, and occasionally in conflict with his staunch Catholic background, produced considerable uneasiness in his mind and in his prior convictions. One light note pierced this otherwise somber period of gloom and mysticism, and this was his acquisition of a high degree of control of the muscles of his ears and scalp, with which talent he often entertained his friends.

In 1826 he was appointed to an assistant professorship at Bonn. In 1827, though in far from robust finances, he undertook the state of matrimony, marrying one Anna Zeiler, the daughter of a local landholder, and somewhat prophetically promised her the fame of an enduring name in lieu of more material wealth. A few months after his marriage, as a consequence perhaps of the combination of family responsibility, overwork, and his recent introspection, he broke down in what amounted to an attack of neurasthenia and despaired of ever being well or worth anything again. Through the benevolence of the university he was granted a leave of absence, and he and his bride spent several leisurely months wandering up and down the Rhineland in a light carriage. From this most pleasant and relaxing departure from his ceaseless pursuit of science he was able to return to his work restored in mind and body, quite resolved to avoid in the future the philosophical speculation and introspection which he felt had contributed to his downfall.

His return to work was followed by a period of intense activity in many fields. He discovered chondrin, one of the constituents of cartilage. He confirmed and elaborated the work on spinal nerves by Bell and Prochaska, defined reflex actions, devised simple experiments to demonstrate the diverse functions of the anterior and posterior spinal nerves, and introduced these concepts into German medicine. He studied the function of the otic (Arnold's) ganglion and the glossopharyngeal nerve. He worked out much of the mechanism of production of the human voice. He made extensive studies of the functions of the various sensory nerves and demonstrated that each type of sensory nerve reacts in the same manner each time it is stimulated, no matter what the nature of the stimulus, rather than each different kind of nerve being sensitive only to special stimuli. His observations in this last matter are sufficiently complete and accurate to be remembered to this day as "Müller's Law of specific nerve energies."[1, 2] He worked out much of the microscopic structure of various glandular tissues, and the publication of his findings in 1830 cleared much of the controversy which had existed in this field since the days of Malpighi.

In 1830 he was promoted to the rank of ordinary professor at Bonn. Still in 1830, he published a paper entitled "Bildungsgeschichte der Genitalien" in which he described the ducts in the urogenital system of the embryo which bear his name, the Müllerian ducts. He introduced Hewson's work on fibrin and blood corpuscles into German medicine, and added to this his own work on the properties of body fluids in "Analysis of Blood, Lymph, and Chyle," published in 1832. He studied also the contractility of capillaries and the irritability of tissues and drew accurate and useful conclusions from these studies.

In the fall of 1832, Karl Rudolphi, professor of anatomy and physiology at the University of Berlin and Müller's former teacher, died, and a number of candidates competed for the vacant position. Müller, in a move unusually bold for him, wrote an open letter to the minister of Prussia declaring that he, Müller, by reason of his work and his ability, had claim to the position superior to that of any other living physiologist. Whether or not it constituted conceit, this approach was certainly successful, for the minister immediately appointed Müller to the post. Thus in the spring of 1833, at the age of 31, he occupied the chairs of anatomy and physiology of the University of Berlin, which positions he was to hold until his death in 1858.

In the last months of 1833, he completed his most famous work, *Handbuch der Physiologie des Menschens,* a two-volume text covering the entire field of physiology. It contained the most complete review of the literature of medicine and natural science since Albrecht von Haller's *Bibliotheca medica,* and many of the concepts set forth were elaborated or confirmed by Müller's own experiments and observations. It was a milepost in the turning of physiology from the speculative to the scientific and experimental method. The *Handbuch der Physiologie* soon became a standard text and reference, not only in Germany but also, through translations, in the other countries of Europe and in America. At this same time he also assumed the editorship of the journal "Archiv für Anatomie und Physiologie" upon the death of its founder and editor, John Frederick Meckel.

At Berlin, in addition to his teaching duties, Müller continued his unrelenting investigation of nature. In 1834 he collaborated with the Swiss-American paleontologist, Agassiz, in the publication of a paper on the comparison of the vertebrae of fossil and living dogfish. In 1834 also he published "Ver-

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gleichende Anatomie der Myxinoiden," a classic monograph on the comparative anatomy of the cyclostomata, the lampreys and eels. He became interested in tumors through his studies of enchondromata, and his paper on the subject in 1838 was one of the earliest accurate discussions of the nature and anatomy of tumors. He described psorospermosis, a parasitic disease of animals, and called attention to the possibility of it occurring in humans also.

As the years passed, Müller became more and more interested in comparative anatomy and studied especially lower forms of marine animals. Toward this purpose, he began to spend his summer vacations along the seacoasts of Europe. The course of his travels incident to observing and gathering marine specimens would have been sufficient to establish him as an authority on the resorts as well as the marine life of all of Europe.

In 1841 he went to Sweden where, with Retzius, he extensively studied Amphioxus, the most primitive chordate and the acquaintance of every biology student today. The year 1842 found him in Naples, noting also the marine fauna about the isle of Capri; 1845 found him on the German island of Helgoland in the Baltic Sea. After these last two trips he completed and published his observations describing the alternation of generations in the coelenterates and the metamorphoses of starfishes.

The year 1847 was spent at Helsinki and 1849 in and about Nice and along the southern coast of France. The summers of 1850, 1851, and 1852 were spent at Trieste. Messina was his port of call in 1853, and a second Helgoland summer was passed in 1854. In 1855 Müller traveled and worked along the west coast of Norway and ran across some high adventure when, in early September, he narrowly escaped death when the trawler on which he was working collided with another vessel. He was again at Nice in 1856, and 1857 was spent at St. Tropez on the north coast of Germany. He supplemented these studies with work on fossils gathered from several German quarries. His discoveries, while not always earth-shaking in their portent, were important contributions to the understanding of fossil and living forms of lower marine animals and were noteworthy for the accuracy and completeness of the method in which they were carried out.

In spite of all of this, it is not for his own work that Müller is most famous, but rather because of the work of the men who were his pupils. The roll of his students is almost a recital of the leadership of German medicine and science in the middle of the 19th century: Virchow, the father of cellular pathology; Schwann, who enunciated the cell doctrine; Helmholtz, the physician-physicist who declared the principles of conservation of energy; Remak, Lieberkühn, Henle, Reichert, Troschel, Bruecke, Du Bois-Reymond, as well as other able, though less renowned, men of German science.

Such professorial success might be ascribed to mere chance in occupying an important teaching post when brilliant men happened along. This does not seem to be the case, however, as Müller's pupils without exception gave a large share of the credit for their success to their early training under their respected teacher. It appears, then, that Müller had some real ability in the matter of training young men to think, to work, and to investigate with a method which would bear real results.

He used the blackboard extensively to diagram each successive point in developing a given subject. His lectures were clear, concise, and stimulating to the interested and talented student, consisting as they did almost wholly of fact upon fact toward a given point, rather than being embellished by flamboyance, dramatics, or wit to make them entertaining to most university students. He was able to ferret out gifted students and to develop their talents by giving them tasks, making them learn to think and to work, and encouraging them in promising fields of investigation.

Helmholtz, for instance, was anxious to complete his medical education as quickly as possible because of financial difficulties at home. Müller was able to persuade him to remain for an extra year in order to complete a project in physiology which he had begun and offered the use of his own laboratory and equipment that this might better be done.

At Müller's invitation, Schwann accepted an assistant's post in the department of anatomy for a pittance salary of 10 thalers a month and was able to continue his investigation into the microscopical structure of tissues begun in his student days. This bore fruit in the enunciation a few years later of the cell doctrine in the monograph "Microscopical Researches in the Accordance in Structure and Growth of Plants and Animals."

Müller was the authority on the nature and development of tumors to whom young Virchow turned for advice and direction, and it was Müller's study of microcephalic skulls which started Virchow on his work in craniology and later in anthropology. Lieberkühn followed directly in his teacher's footsteps when he demonstrated psorospermosis to definitely be a parasitic disease of humans.

To the best of his students Müller was a close personal friend, always prepared to lend them encouragement, advice, or assistance as needed. It was at the suggestion of his students that he took up ice skating at the age of 45, and he was even known to race a student from one door to the next in a corridor when he was past 50. Many a joke and anecdote from

50 *and seven*

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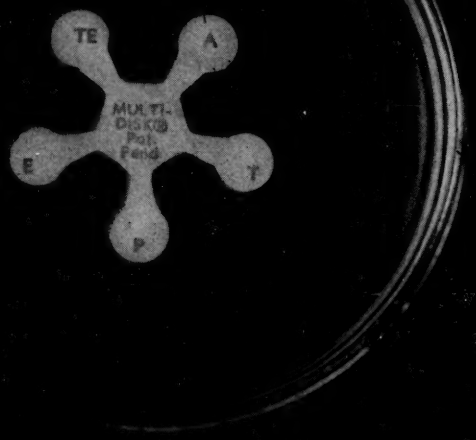

This sensitivity test shows ERYTHROCIN, penicillin and three broad-spectrum antibiotics against a typical strain of *E. coli*. Note that ERYTHROCIN and penicillin do not affect growth of the organism—*while all three broad-spectrum antibiotics show marked inhibitory action.* Since ERYTHROCIN is inactive against gram-negative organisms, it is less likely to cause alteration in common intestinal flora—with an accompanying low incidence of side effects.

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him found its way about the laboratories of his department, ample evidence that his sense of humor had not abandoned him in his maturity.

What the spirit of this man might be, that he could guide and train the great scientific minds of half a century in his country, might well be investigated with profit. His had to be a method of science, to observe and to investigate the phenomena of nature in an objective and successful manner. He could almost sense the workings of things by observing them, suggesting, for instance, many years before the myenteric plexuses were demonstrated, that there must be a separate nervous system for the intestinal tract. His experiments were designed to throw light on structures and functions, and he accepted the results he obtained for what they were with an open and receptive mind.

He was a vitalist, in that he concluded that a vital force was an absolute explanation for vital phenomena, independent of any observable chemical or physical properties. The very essence of his approach to science is contained in the following passage from his *Handbuch der Physiologie* concerning the origin of organic matter and the organic force: "How organic beings were originally produced, and how organic matter became endowed with a force which is absolutely necessary to the formation and preservation of this organic matter, but which is manifested only in it, it is beyond the compass and knowledge of our experience to determine. The difficulty is not removed by saying that the organic force has resided in the organic matter from eternity, as if organic force and organic matter were only different ways of regarding the same object; for, in fact, the organic phenomena are presented only by a certain combination of the elements; and even organic matter, itself susceptible of life, is reduced to inorganic compounds as soon as the cause of the vital phenomena, namely, the vital force, ceases to exist. This problem, however, is not a subject of experimental physiology, but of philosophy. Conviction in philosophy and in natural science has entirely different bases; the first suggestion here, therefore, is not to be led away from the field of rational experiment. We must be content to know that the forces which give life to organic bodies are peculiar, and then to examine more closely their properties."[3]

For some months before his death Müller was in somewhat failing health, apparently as a result of arteriosclerosis, and he had even prepared to give up his teaching post. However, his death was rather unexpected when he passed away in his sleep on April 28, 1858, after a prior day of full activity and reasonably good health.

He had been honored during his lifetime as had few other scientists, being elected to active or honorary memberships in more than 60 scientific and medical societies in Europe and America. On him had also been conferred various orders of knighthood by the kings of Bavaria, Sweden, Prussia, and Sardinia. The occasion of his funeral called forth the great men of science in all of Europe, and Rudolph Virchow delivered the eulogy. Müller had been staunch in his Catholic faith for many years, and he was buried with all of the formal rites of the church.

Since his death and to the present time, his memory is venerated by men of science, especially in Germany where scarcely a medical meeting proceeds without an invocation of the name of Johannes Müller, the father and patron of scientific medicine. Though his accomplishments have often been recalled and his memory hallowed, there is perhaps nowhere so apt an epitomization of Müller as that contained in Virchow's eulogy at Müller's funeral, which follows below.

"How can one tongue adequately praise a man who presided over the whole domain of the science of natural life? . . . Is it possible in a few short minutes to sketch the history of a conqueror who, in restless campaigns, through more than one generation, only made use of each new victory as a standpoint whereon he might set his feet and boldly look out for fresh triumphs? . . . We have to inquire what it was that raised Müller to so high a place in the estimation of his contemporaries; by what magic it was that envy became dumb before him and by what mysterious means he contrived to enchain to himself the hearts of beginners and to keep them captive through many long years? . . . Müller vanquished mysticism and phantasms in the organic kingdom and he was most distinctly opposed to every dangerous tendency, whether it was pursued under the pretext of physiology or belief, or merely in accordance with conjectures. Müller did not discover, but he firmly established the exact method of investigating natural sciences. Hence, he did not found a school in the sense of dogmas—for he taught none, but only in the sense of methods. The school of natural science which Müller created knew no community of doctrine, but only of facts and still more of methods."[4]

BIBLIOGRAPHY

References:

1. Fulton, John F.: Selected Readings in the History of Physiology, Charles C Thomas Co., Springfield & Baltimore, 1930, pp. 274-276.
2. Müller, Johannes: Elements of Physiology (translated from the German, with notes) by Baly, William. Printed for Taylor and Walton by Samuel Bentley, London, 1838, Vol. 1, pp. 766-767.
3. Idem, Vol. 1, p. 18.
4. Walsh, James J.: Makers of Modern Medicine, Fordham University Press, New York, 1915, pp. 221, 237.

Additional References:

1. References 2 and 4, entire volumes.
2. Biographisches Lexikon der hervorragender Ärtze Urban & Schwarzenberg, Berlin und Wien, 1932, Vol. 4, pp. 285-290.
3. Encyclopedia Britannica, 1948, Vol. 15, pp. 949-950.

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DANIEL C. MOORE, M.D., The Mason Clinic, Seattle.
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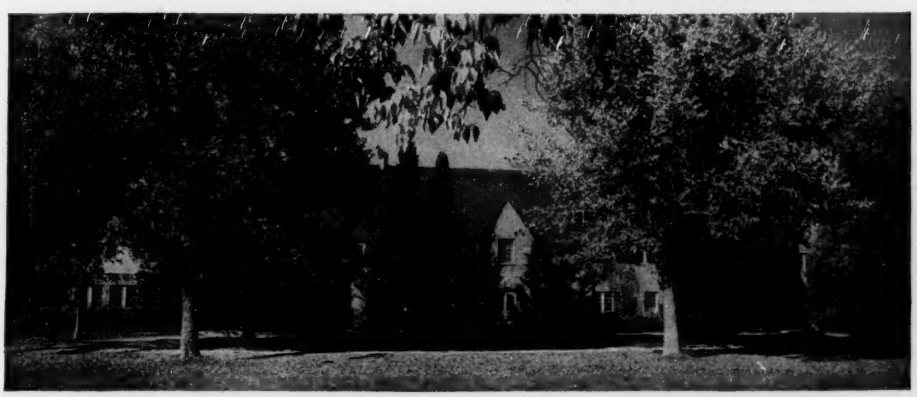

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ANNOUNCEMENTS

The seventh annual meeting of the International Academy of Proctology will be held in New York City, March 23-26. Panel discussions will highlight scientific sessions at the Hotel Plaza in New York City on March 23, 25, and 26, and at the Jersey City Medical Center on March 24.

The 28th annual spring congress of the Gill Memorial Eye, Ear, and Throat Hospital, Roanoke, Virginia, will be held April 4-9. Information may be secured from the hospital, 711 South Jefferson Street, Roanoke, Virginia.

The next scheduled examinations (Part II), oral and clinical, for all candidates of the American Board of Obstetrics and Gynecology will be conducted at the Edgewater Beach Hotel, Chicago, May 12-28, 1955. Formal notice of the exact time of each candidate's examination will be sent in advance. Candidates who participated in the Part I examinations are notified that case abstracts must be in the office of the secretary of the board no later than February 28.

The American Hospital Association announces that National Hospital Week will be observed from May 8 through 14, 1955. The theme of the observance this year is "Your Hospital . . . A Tradition of Service."

The American Congress of Physical Medicine and Rehabilitation announces that June 1 will be the closing date for entries in its annual essay contest. Contributions may be on any subject relating to physical medicine or rehabilitation. Medical students, interns, and residents are eligible to participate. The address to be used is 30 North Michigan Avenue, Chicago 2, Illinois.

A scholarship contest in which winners will receive prizes of $1,000 and $750 and three-months scholarships has been announced by the Foundation of the American Society of Plastic and Reconstructive Surgery, Inc., 30 Central Park South, New York 19, N. Y. For the junior classification, contestants must be residents or those who have been in the practice of plastic surgery no longer than five years. For the senior classification, five or more years of practice in the specialty is a requirement. Closing date for entries is July 1, 1955.

A short intensive course on the laboratory diagnosis and pathology of parasitic infections will be presented at the Louisiana State University School of Medicine, New Orleans, August 15-27, 1955. Although designed primarily for pathologists and technologists, the course will also be of interest to general practitioners, pediatricians, internists, etc. A limited number may attend, and a fee of $50 will be charged. Complete information may be secured from Dr. Clyde Swartzwelder, Department of Microbiology, School of Medicine, 1542 Tulane Avenue, New Orleans 12, Louisiana.

The 33rd annual scientific and clinical session of the American Congress of Physical Medicine and Rehabilitation will be held August 28-September 2, inclusive, at the Hotel Statler, Detroit. Programs may be secured from the Congress, 30 North Michigan Avenue, Chicago 2, Illinois.

THE KANSAS PRESS LOOKS AT MEDICINE

Editor's Note. In this section the JOURNAL *reproduces editorials relating to medicine which have appeared in the lay press. An effort is made to include both favorable and unfavorable comments, and the Editorial Board in no instance assumes responsibility for the opinions expressed.*

DOCTORS' DREAM CAR

Surgeons in symposium in Atlantic City this week were in agreement that humans enclosed in present motor cars are as vulnerable to injury as a teacup shipped loose in a barrel. They had specific design improvements to suggest, moreover, which would reduce the highway death toll—which now runs in excess of 30,000 a year—by from 50 to 80 per cent.

The doctors' dream car would have seats which were a part of the frame. Retractable seat belts. A steering column which telescoped downward under impact. Doors that couldn't fly open. A four-inch thick crash panel of foam material over the dashboard. No projecting instruments, such as rear-view mirrors. A 2½-foot thick front nose, made of aluminum foam or something like that, which would absorb shock by crumpling slowly in event of crash.

This dream car, however, is not likely to make an early appearance on the road, and neither is any noticeable reduction in the number of highway accident fatalities to be expected soon from the surgeons' most practical suggestions.

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A valuable aid in rehabilitating the arthritic patient

MAJOR ADVANTAGES: Greater anti-rheumatic activity than cortisone; smaller doses produce clinical improvement faster and more uniformly.[1]

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REFERENCES: 1. Boland, E. W. and Headley, N. E., *J.A.M.A.* **148**:981, March 22, 1952. 2. Ward, L. E., Polley, H. F., Slocumb, C. H. and Hench, P. S., *J.A.M.A.* **152**:119, May 9, 1953. 3. Snow, W. B. and Coss, J. A., *N.Y. State J. Med.* **52**:319, Feb. 1, 1952.

desire to create sales and not safety. Detroit would not take kindly to exterior rear-view mirrors which destroyed the illusion of streamlining, or to a thick foam rubber cover for much of the shiny chrome.

Motorist resistance to these reforms would be as great as the industry's. Parents of children dread the thought of the added chore of unstrapping the children at every rest-room pause. Nonparents continue unshaken in their delusion that they are the most careful of drivers and that while the crash death rate is horrifying, it is always somebody else who gets killed.

Despite that, the professional men deserve a round of applause for trying. Perhaps they have tossed up some ideas which through the years will sink in.

The day may come when the typical driver will habitually buckle his belt before he steps on the starter, and will demand the substitution of three feet of purposeless overhang in the back for a like space of shock cushion up front.—*Chanute Tribune, November 20, 1954.*

New Specialty Group Formed

The American College of Angiology announces its organization as a scientific body dedicated to the teaching and dissemination of knowledge concerned with the science and practice of angiology and to research on the subject. The growing complexity and increasing incidence of diseases of the blood vessels prompted formation of the group.

The first annual meeting will be held at Atlantic City on June 4, 1955, and will include a scientific program. The organization will also function as a specialty board for the certification of qualified physicians and surgeons and will establish residencies in angiology in qualified hospitals and medical institutions.

The official journal of the college will be *Angiology,* published by the Williams and Wilkins Company, Baltimore.

Committee on Toxicology

A new A.M.A. group, a Committee on Toxicology, is now studying ways of stopping accidental poisonings through misuse of common household chemicals such as drugs, cosmetics, cleaning fluids, and paints.

The committee has collaborated with various national organizations interested in these problems, is offering advice for the standardization of safe coatings for children's toys and furniture, has suggested provisions for the labeling of lead paints, and has participated in the revision of publications on the subject.

BOOK REVIEWS

Review of Medical Microbiology. By Ernest Jawetz, Joseph L. Melnick, and Edward A. Adelberg. Published by Lange Medical Publications, Los Altos, California. 360 pages. Price $4.50.

The authors specify in their preface of the *Review* that they intended to prepare a brief as well as accurate presentation of medical aspects of microbiology. This they have accomplished.

Each disease is discussed in a similar manner. First the etiologic agent and its most important characteristics are discussed. This is followed by a short discussion of pathogenesis, pathology, and clinical findings. Then the authors discuss diagnostic techniques, epidemiology, and treatment.

Many new developments have occurred in fields related to medical microbiology. To help the reader understand these developments the authors devote a large portion of the book to a presentation of fundamental principles.

There is approximately equal coverage for each of the following aspects of microbiology: (1) basic principles, (2) bacterial and mycotic infections, and (3) rickettsial and viral infections. Blood group substances, on the other hand, are inadequately discussed, and the field of parasitology is barely mentioned.

This *Review* can be recommended especially to house officers and practicing physicians who may find it necessary to obtain quickly a clear and concise discussion concerning most aspects of medical microbiology.—*A.W.*

Fluid and Electrolytes in Practice. By Harry Statland. Published by J. B. Lippincott Company, Philadelphia. 206 pages. Price $5.00.

Many physicians in Kansas and Missouri have heard Dr. Statland's presentations on fluid and electrolyte balance on the University of Kansas circuit courses. These lectures have been considerably enlarged and are now presented in book form. The first portion of the book covers the basic principles of fluid and electrolyte movement and the second part discusses the management of fluid and electrolyte balance in specific disease conditions. Many readable fluid and electrolyte texts are now available, and Dr. Statland's volume is one of the best. It is designed specifically for the physician in general practice who meets many of the problems he discusses. We very much enjoyed Dr. Statland's book.—*W.L.V.*

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Current Concepts in Digitalis Therapy. By Bernard Lown and Samuel A. Levine. Published by Little, Brown and Company, Boston. 164 pages. Price $3.50.

"The use of digitalis marks the beginning of the modern era of cardiac therapy." With this introductory statement the authors begin a thorough presentation of "The Action and Clinical Use of Digitalis," "Digitalis Intoxication," "Electrolytes and Digitalis," "Relation of Potassium to Digitalis Intoxication," "Paroxysmal Atrial Tachycardia with Block," "A Digitalis Tolerance Test," and, finally, concluding remarks.

The material presented is pertinent, complete, and supplemented with an extensive bibliography. Often the presentation is less than clear, making reading difficult. In spite of this very real weakness, this is a splendid volume. Every medical student and every clinician observing the effects of and using digitalis should study this book. No textbook of pharmacology, cardiology, or medicine presently offers such an authoritative discussion.—*M.H.D.*

Thoracic Surgery. Second Edition. By Richard H. Sweet. Published by W. B. Saunders Company, Philadelphia. 381 pages, 159 illustrations. Price $10.

This is the second edition of a book well-received and much-needed at the time of its first appearance four years ago. The author in his original preface states, "The present volume is based upon the concept that any properly qualified surgeon can acquire with relative ease a satisfactory proficiency in thoracic surgery by applying the technics herein described." Accordingly, he devotes himself to the problems of operative technic in thoracic surgery, the variations of these technics to suit different pathological processes, and postoperative care. As a valuable adjunct specific chapters are devoted to the surgical anatomy of the thorax and general technical considerations, such as anesthesia and particular thoracic incisions. A chapter is devoted to the various instruments employed in thoracic surgery.

Little space is devoted to the indications or the results of thoracic operations, attention being constantly maintained toward operative details. It is a tribute to the author that in this rapidly advancing field his selection of material has proved to be practical. His lengthy experience extending over many years with intrathoracic procedures lends judgment to his comments regarding various technics.

In regard to operations on the heart he states: "No useful purpose would be accomplished by an effort to describe and illustrate all the operations which have been proposed or tried; therefore, only those which should have an established value will be described. Those whose value remains uncertain or whose technic is still in the early phases of development will merely be mentioned." The various disorders of the heart for which surgical procedures have been suggested are arranged according to classification of "established procedures and unestablished procedures."

Throughout, the illustrations are numerous and of unusual excellence. The content of the book is arranged in a logical order, and the operative steps of each procedure are well described.

Although this book represents to a large extent the personal opinions of the author and contains no bibliography, this is in no sense a criticism because of the well-deserved position that the author has as a leader in the field of thoracic surgery. This book will be welcomed by those surgeons interested in thoracic surgery and should be considered almost a necessity for those receiving surgical training in thoracic surgery.—*C.F.K.*

The Medical Staff in the Hospital. Second Edition. By Thomas R. Ponton, revised by Malcolm T. MacEachern. Published by Physicians' Record Company, Chicago. 373 pages. Price $7.25.

This authoritative book is concerned with a subject which physicians as a rule are apt to consider uninteresting, and yet there is within it something which it would be well for every doctor of medicine to read. Not every physician will be concerned with the entire book, but there is some part which does concern him. Included are discussions of the obligations, responsibilities, and privileges of staff membership, together with relationships between medical staff and administration.

Chapter headings include: The Governing Body and the Medical Staff of the Hospital; The Physician in the Hospital; Selection and Appointment of the

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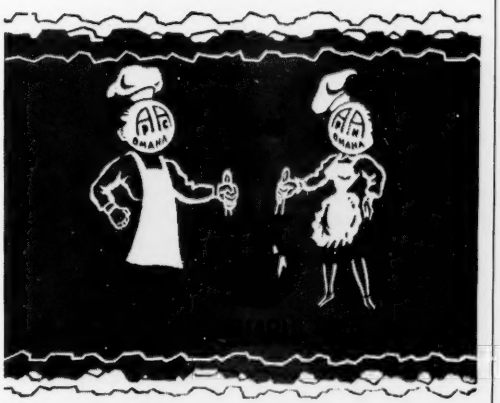

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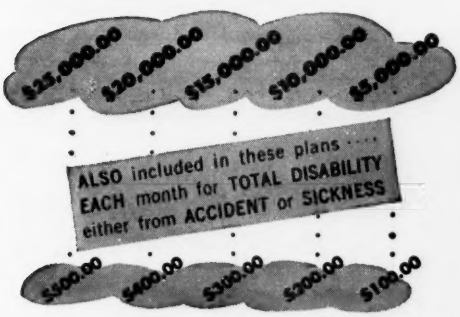

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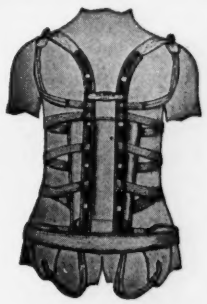

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The book also includes chapters detailing the requirements for the hospitals to obtain approval for internships and residencies, and the minimum standards for accreditation as formulated by the Joint Commission on Accreditation, which has assumed the responsibility for all hospital accreditation in the United States and Canada.

Certainly every hospital which is worthy of the name should have one of these volumes available for staff members to consult, and many physicians will find it a useful volume for their own libraries. —*O.R.C.*

Reproductive System. Volume 2 of The Ciba Collection of Medical Illustrations. By Frank H. Netter. Commissioned and published by Ciba Pharmaceutical Products, Inc., Summit, New Jersey. 302 pages. Price (sold at cost) $13.

A few years ago Ciba Pharmaceutical Products, Inc., undertook to publish a series of books collectively titled "The Ciba Collection of Medical Illustrations." The first volume—*The Nervous System*—was published some time ago, and recently the second volume—*The Reproductive System*—was released. The book is of 302 pages, 9½ by 12 inches, and in the same format as Volume I.

Profusely illustrated with 233 plates of the superb work of Frank H. Netter, M.D., and with excellent explanatory texts, the book illustrates both normal and pathologic anatomy of the reproductive systems of both male and female. It is a fitting companion for the earlier volume and will undoubtedly reach its deserved place in many medical libraries, both public and private.—*O.R.C.*

Screening for Visual Defects

"Screening School Children for Visual Defects" is the title of a new pamphlet issued by the Children's Bureau, U. S. Department of Health, Education, and Welfare. It outlines simple principles for increasing the accuracy of measurements now used for testing the vision of school children.

The information presented is based on a study of seven different procedures used in the public schools of St. Louis, showing the degree to which results of each procedure corresponded with an ophthalmologist's clinical findings. The study was made with the support of the National Society for the Prevention of Blindness, the Missouri State Department of Public Health and Welfare, the Children's Bureau, the Department of Ophthalmology of Washington University School of Medicine, and the Office of Naval Research.

Copies of the pamphlet may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., for 35 cents.

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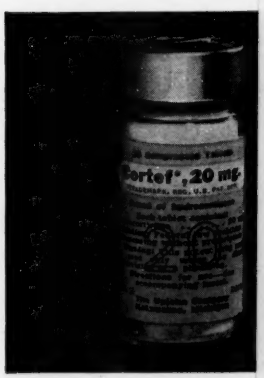

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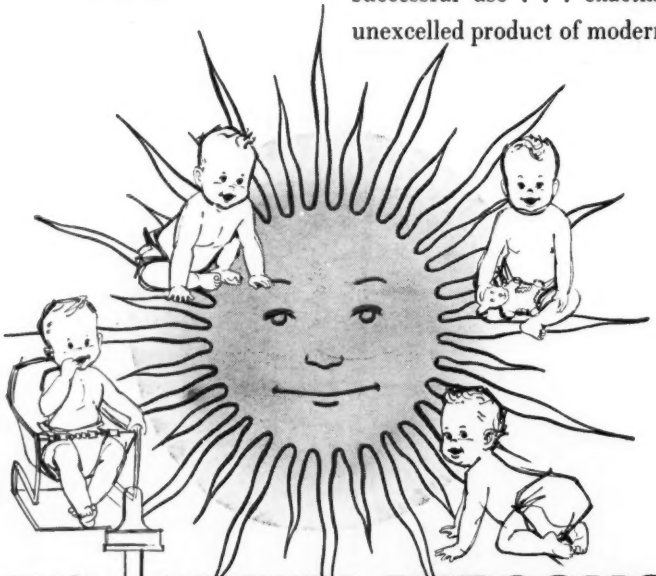

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